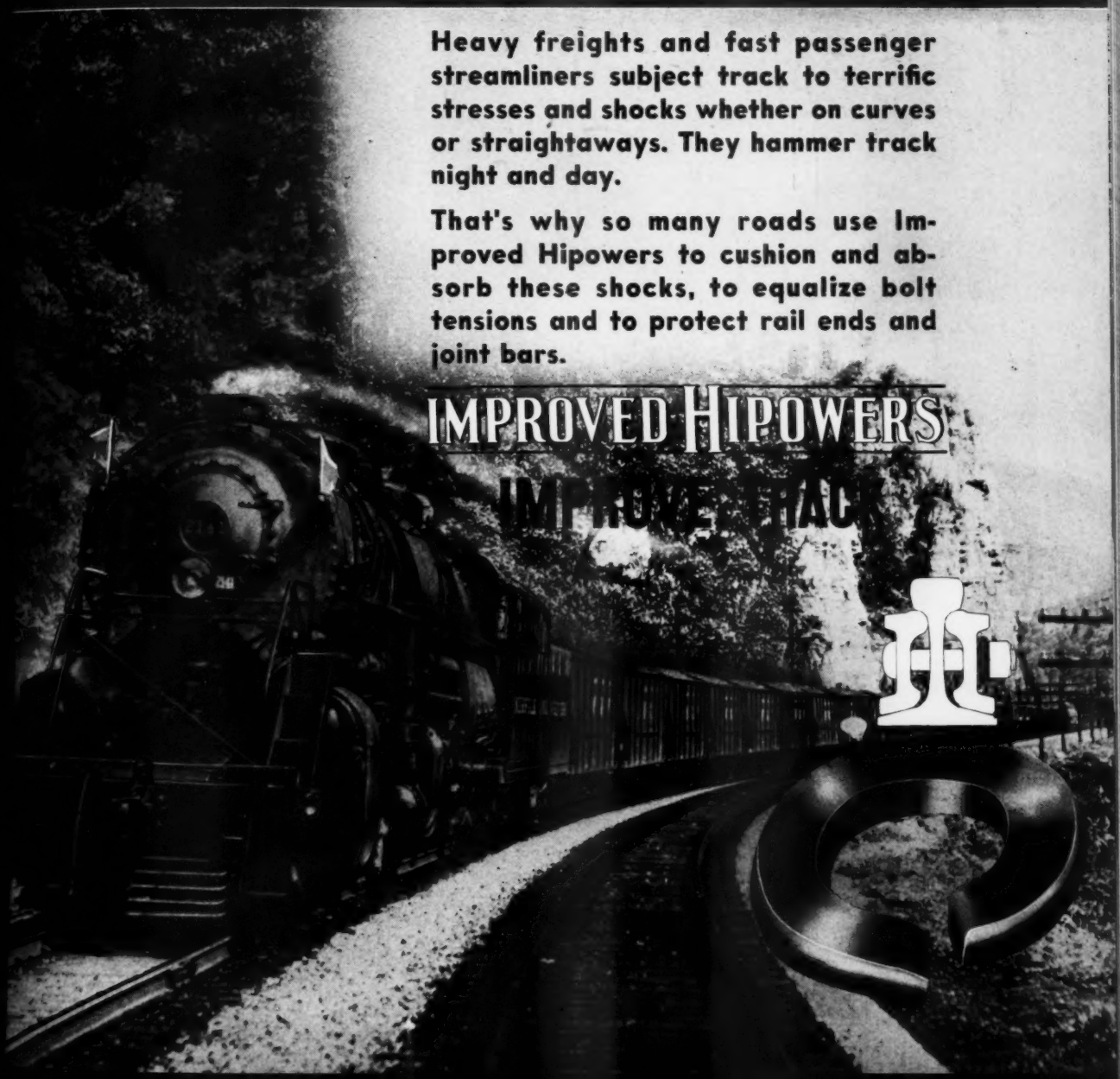
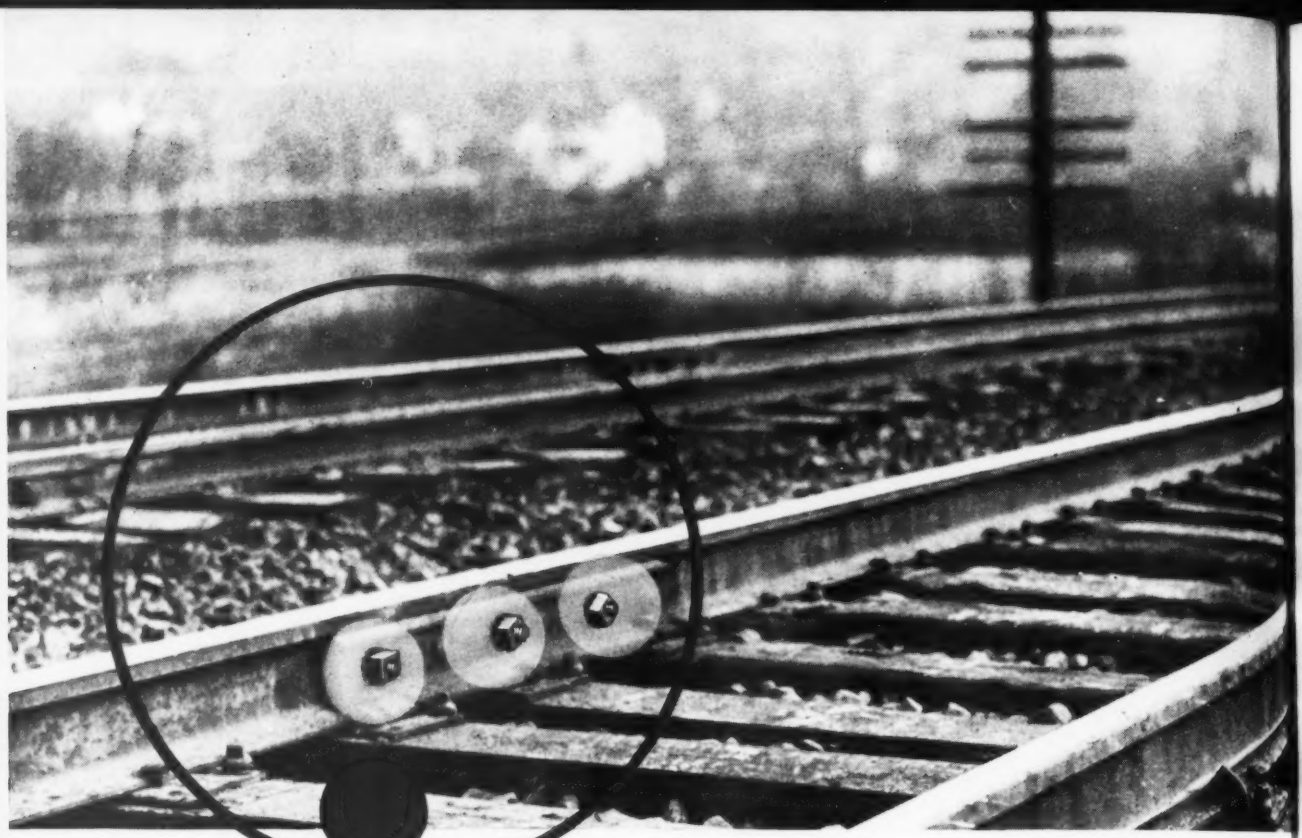
AUGUST, 1949

Railway Engineering and Maintenance


Heavy freights and fast passenger streamliners subject track to terrific stresses and shocks whether on curves or straightaways. They hammer track night and day.
That's why so many roads use Improved Hipowers to cushion and absorb these shocks, to equalize bolt tensions and to protect rail ends and joint bars.
IMPROVED HIPOWERS
IMPROVE TRACK



smoother riding track

Reliance Hy-Pressure Hy-Crome Spring Washers contribute to smoother riding track by maintaining rail joint bolts under proper tension, thus improving track-joint and rail-end conditions.

Your new rail laying program can go through on schedule if Reliance Hy-Pressure Hy-Crome Spring Washers are specified and used on track-joint bolts. Dependable and prompt delivery service of Reliance Hy-Pressure Hy-Crome Spring Washers backed by adequate inventories and prompt experienced personnel, will not hold up your laying gangs and create unnecessary expense and delay.

WRITE for Railroad Track Folder showing the many spring washers of the Hy-Crome family used on track and track accessories.

Reliance **HY-PRESSURE HY-CROME** *spring washers*

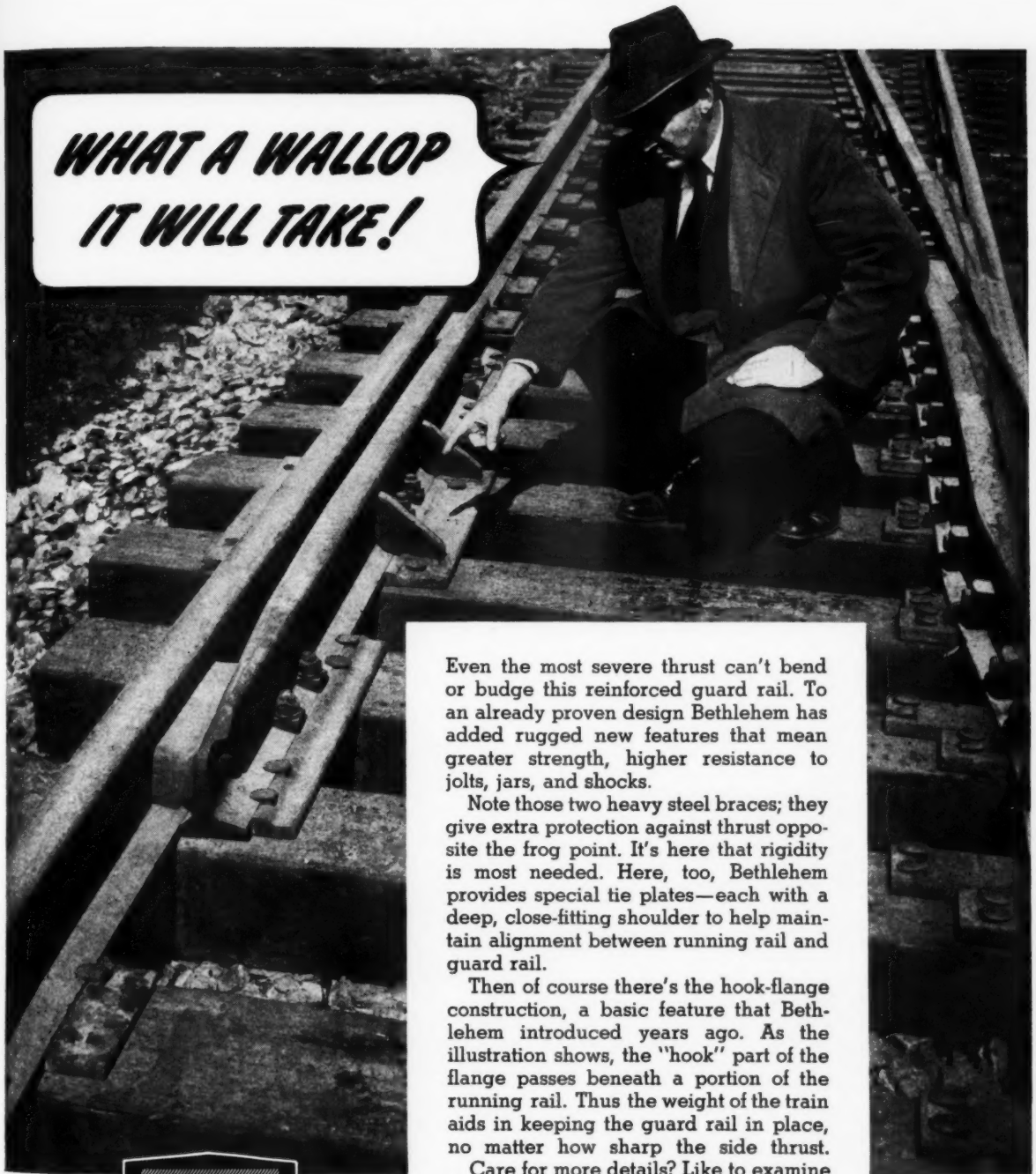
EATON

EATON MANUFACTURING COMPANY

RELIANCE DIVISION
Office and plant MASSILLON, OHIO

Sales Offices: New York • Cleveland • Detroit • Chicago • St. Louis • San Francisco • Montreal

Bethlehem's Hook-Flange Guard Rail is Double-Braced Against Shock



Even the most severe thrust can't bend or budge this reinforced guard rail. To an already proven design Bethlehem has added rugged new features that mean greater strength, higher resistance to jolts, jars, and shocks.

Note those two heavy steel braces; they give extra protection against thrust opposite the frog point. It's here that rigidity is most needed. Here, too, Bethlehem provides special tie plates—each with a deep, close-fitting shoulder to help maintain alignment between running rail and guard rail.

Then of course there's the hook-flange construction, a basic feature that Bethlehem introduced years ago. As the illustration shows, the "hook" part of the flange passes beneath a portion of the running rail. Thus the weight of the train aids in keeping the guard rail in place, no matter how sharp the side thrust.

Care for more details? Like to examine some installations? Call or write a Bethlehem man—he'll be glad to oblige.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
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COST PER FOOT
OF TAMPING
GOES DOWN
with BARCO
Over 100 railroads use Barco for spot or gang tamping—because Barco does more and better work in *less* time, and at less cost. Light in weight and perfectly balanced, Barco is self-contained, portable, eliminates need to remove ballast from between the ties. When the ballast is fouled or "cemented" the power developed by the BARCO tytamper is sufficient to break up the "cemented" ballast during the tamping operation. No digging out or loosening up the ballast before tamping when BARCO tytampers are used, as would be necessary with other tampers with less power. Write Barco Manufacturing Co., 1805H Winnemac Avenue, Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal, Canada.
BARCO
UNIT TYTAMPERS

FREE ENTERPRISE • THE CORNERSTONE OF AMERICAN PROSPERITY

YOU ARE PAYING FOR THESE ADVANTAGES

Why not have them?

Your Northwests are on critical work. They must travel long distances. They must be easily handled, must be easy to load and unload. They must be easily convertible from Crane to Shovel to Dragline. They must be easily cared for with a minimum time for maintenance.

Northwests bring you advantages found in no other equipment of the same type. You are paying for these advantages. Why not have them?

- **Simplicity of Design** — assures easy upkeep.
- **"Feather-Touch" Clutch Control** — easy operation without complications. No fear of shutdown on the line because of control failure.
- **Cushion Clutch** — reduces overloads on parts under power. Increases cable and machine life.
- **Cast Steel Bases with Cast Steel Machinery Side Frames** — plenty of strength — assured shaft alignment.
- **Uniform Pressure Swing Clutches** — smoother operation — fewer adjustments.
- **Ball or Roller Bearings on all High-Speed Shafts** — minimum loss of power to friction.
- **Northwest Worm Boom Hoist** — boom up, or down — no jumping, no chattering — just velvet action under power both up and down.
- **Northwest Crawlers** — easy steering — treads won't jam up between rollers in crossing rail — all gears fully enclosed — self-cleaning action.
- **Easy Convertibility** — all Northwests can be converted from Shovel to Crane, Dragline or Pullshovel by simply changing booms.

Here is a combination of advantages that makes the Northwest a real railway man's machine. It brings you dependability, smoothness of operation, versatility and high output. You can check these statements with the many Class I Railways that are using them. Plan now to have Northwest equipment on every division.

NORTHWEST ENGINEERING COMPANY
1513 Field Building
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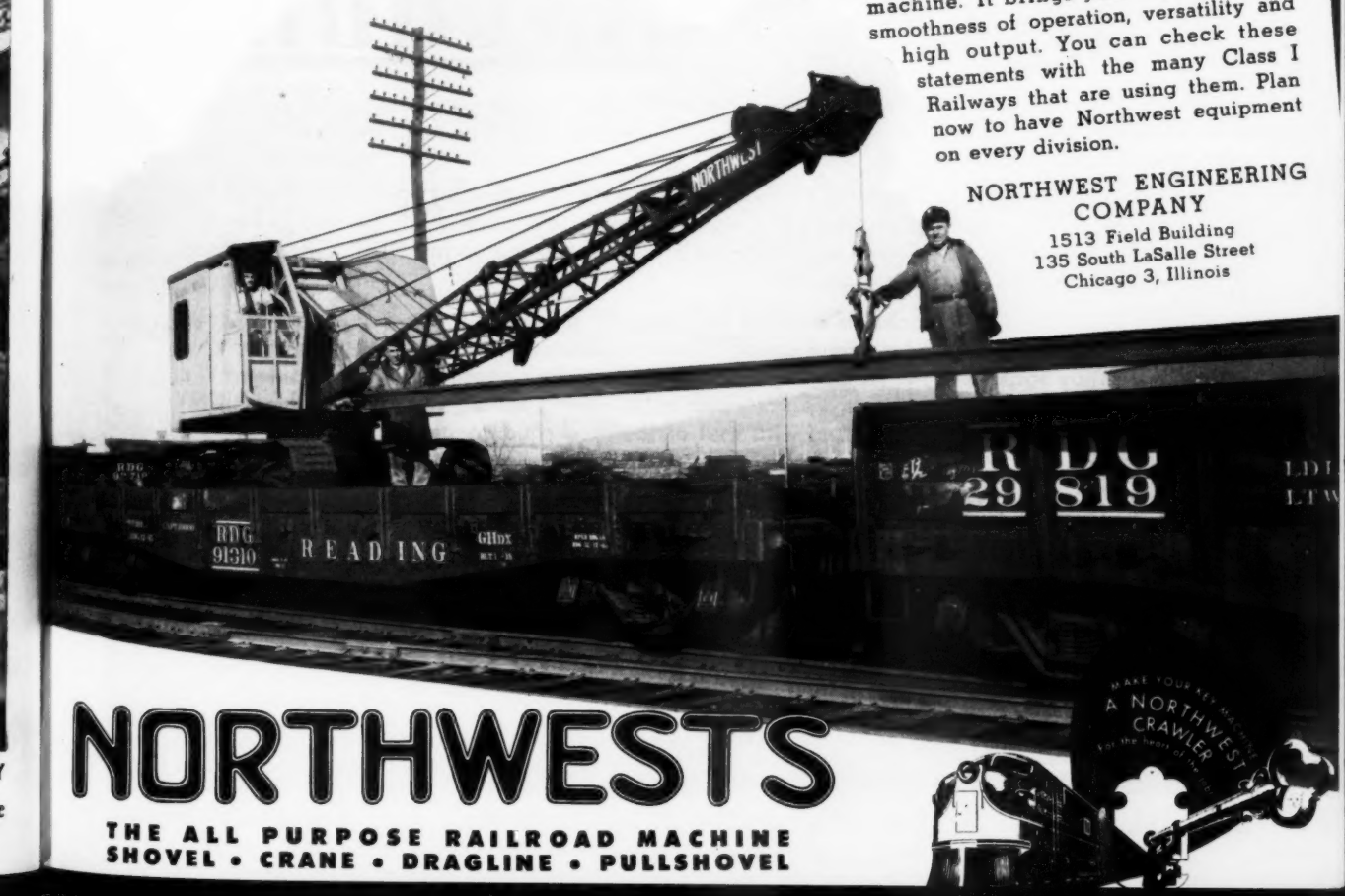
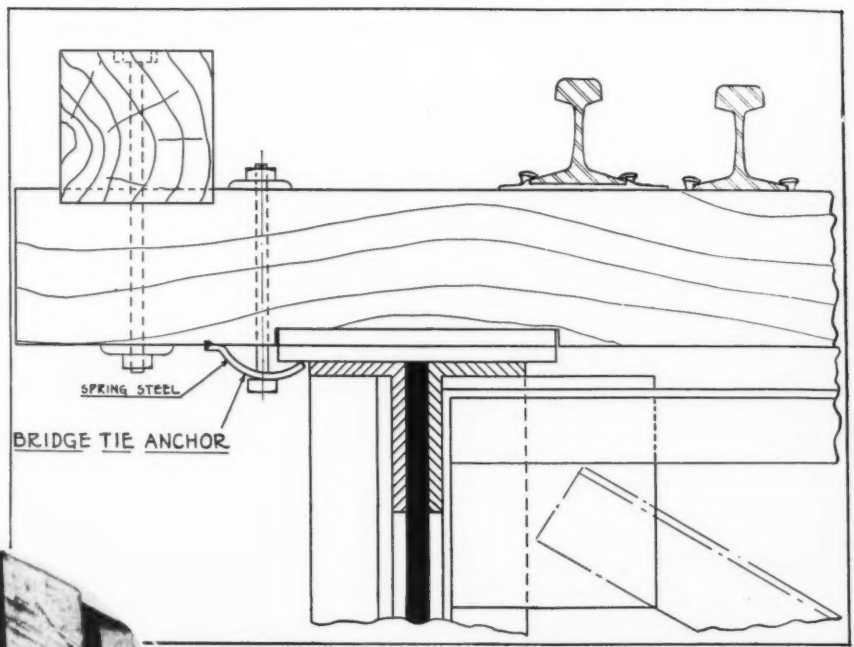
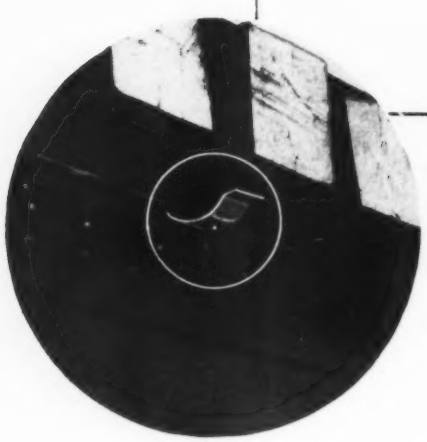
Chicago 3, Illinois



NORTHWESTS

THE ALL PURPOSE RAILROAD MACHINE
SHOVEL • CRANE • DRAGLINE • PULLSHOVEL





BRIDGE TIE ANCHOR

The need for an improved method for fastening or anchoring open deck bridge ties to the supporting steel members has resulted in the development of the Bridge Tie Anchor. This device is a 3-inch wide high-carbon, heat-treated spring steel unit to be used with a standard ¾ inch bridge deck bolt.

The Bridge Tie Anchor is installed on the under side of a bridge tie, as shown in the illustration, and creates a strong spring pressure holding the tie and the supporting member firmly together. All variations in pressure on the bolt caused by the bending of the bridge ties under wheel loads are absorbed in the spring action, the load on the bolt increasing very little as compared with that of the usual rigid connection.

The Bridge Tie Anchor is simple to install, low in first cost and economical to maintain. One size fits all structures.

THE RAILS COMPANY

General Office
178 GOFFE STREET, NEW HAVEN 11, CONN.

ST. LOUIS, MO. HOBOKEN, N. J. CHICAGO, ILL.

PUT STATION TRAFFIC on the right road

Where is a station's heaviest traffic? In the baggage rooms . . . the freight depots . . . the loading platforms. They are the real "arteries."

Put that traffic on the right road . . . on heavy duty Mastic Floors made with Flintkote Flooring Emulsion.

This modern flooring material gives you an all-purpose floor that's all ways good. Just look at these important advantages.

1. ***Durability.*** Mastic floors made with Flintkote Flooring Emulsion take constant traffic, withstand heavy point loads . . . without shattering, and with a minimum of wear.

2. ***Maintenance.*** You can almost forget it. These heavy-duty floors do not crack or spall . . . are self-healing of minor scars and cuts. Can be patched if necessary, quickly and easily . . . and with a minimum of interruption to traffic.

3. ***Rapidly Installed.*** Either for new flooring or resurfacing, Mastic Floors made with Flintkote Emulsions are laid quickly. Can be installed over any clean, firm base, and are ready for normal traffic within 48 hours.

4. ***Better working conditions.*** Because these floors are dustless, resilient, shock-absorbing and sound-deadening, they help provide working conditions that are clean, comfortable and quiet.

And anywhere you want to spruce up a bit . . . in waiting rooms, office spaces, and the like . . . use Mastic Underlayment as the ideal leveling course beneath your decorative floor.

Get complete information on Flintkote Flooring Emulsions. Write today, and ask us to tell you how you can put station traffic on the right road with Mastic Floors.

THE FLINTKOTE COMPANY
Industrial Products Division
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Gentlemen: Please send me your new FREE booklet on Flintkote Flooring Products.

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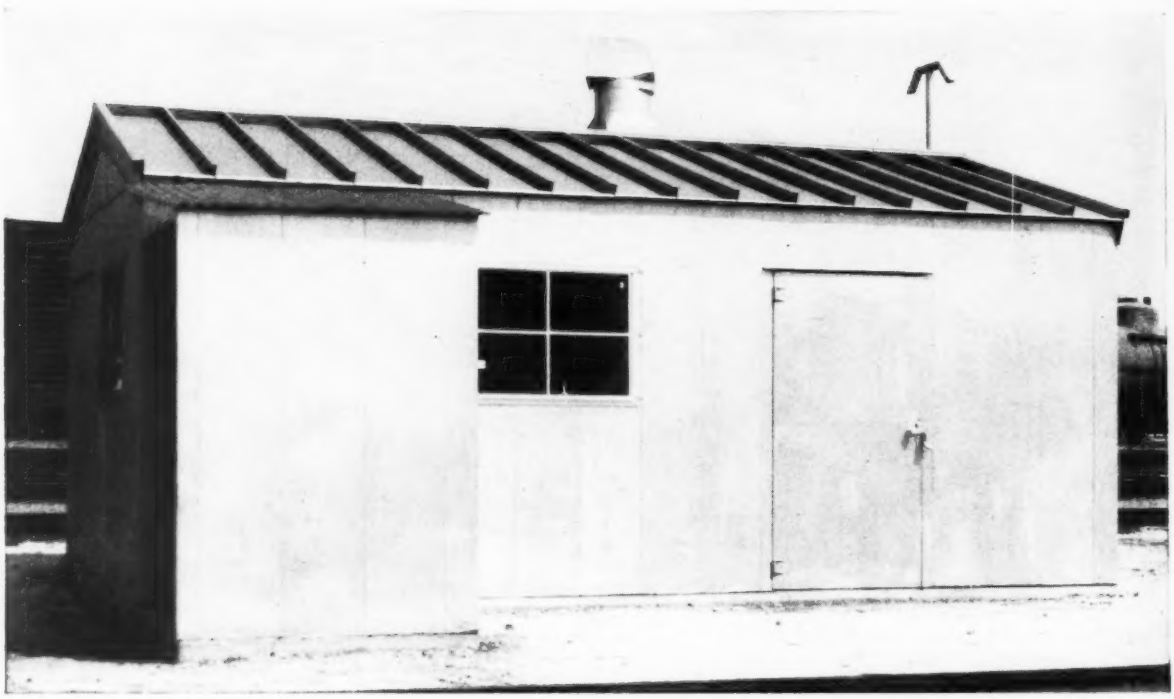
FIRE HATES THIS BUILDING



One big reason why Standard ARMCO STEELOX Buildings are so popular with railroad men is their fire-resistant, all-steel construction. You gain added safety for men and materials. Insurance rates are lower. And replacement and maintenance problems are simplified.

STEELOX Buildings are excellent for either permanent or temporary sites. Small bunk houses and similar structures can often be loaded onto flat cars intact and moved to a new site. Or it is a simple matter to dismantle the entire structure and reerect it at a new location. A section gang can do the job simply and quickly. Even after several such "moves" your building remains tight and dry.

You'll like the way STEELOX Buildings stay neat and attractive year after year. There is nothing to get out of order—nothing to crack, warp or rot. Individual sections are made of 18- and 20-gage ARMCO Galvanized Steel. This durable material is two or three times heavier than ordinary galvanized roofing and siding. Long service is assured.

There is a type and size of ARMCO STEELOX Building to meet specific railroad needs—machine shops, tool houses, Diesel motor garages, utility buildings, yard offices, waiting stations and many others. Write us today for complete information. Armco Drainage & Metal Products, Inc., 785 Curtis Street, Middletown, Ohio.

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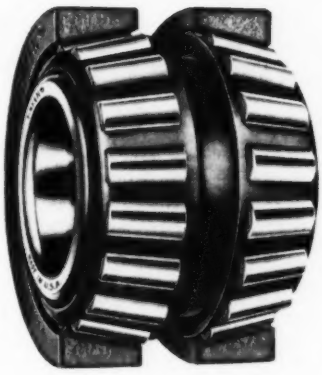
ARMCO

ARMCO STEELOX BUILDINGS

CARRIES EIGHT HUSKY MEN *COMFORTABLY AND SAFELY* ON TIMKEN® BEARINGS

Manufactured by Fairmont Railway Motors, Inc., Fairmont, Minnesota.



Timken two-row bearings as used on Fairmont A3 Series D car axles.

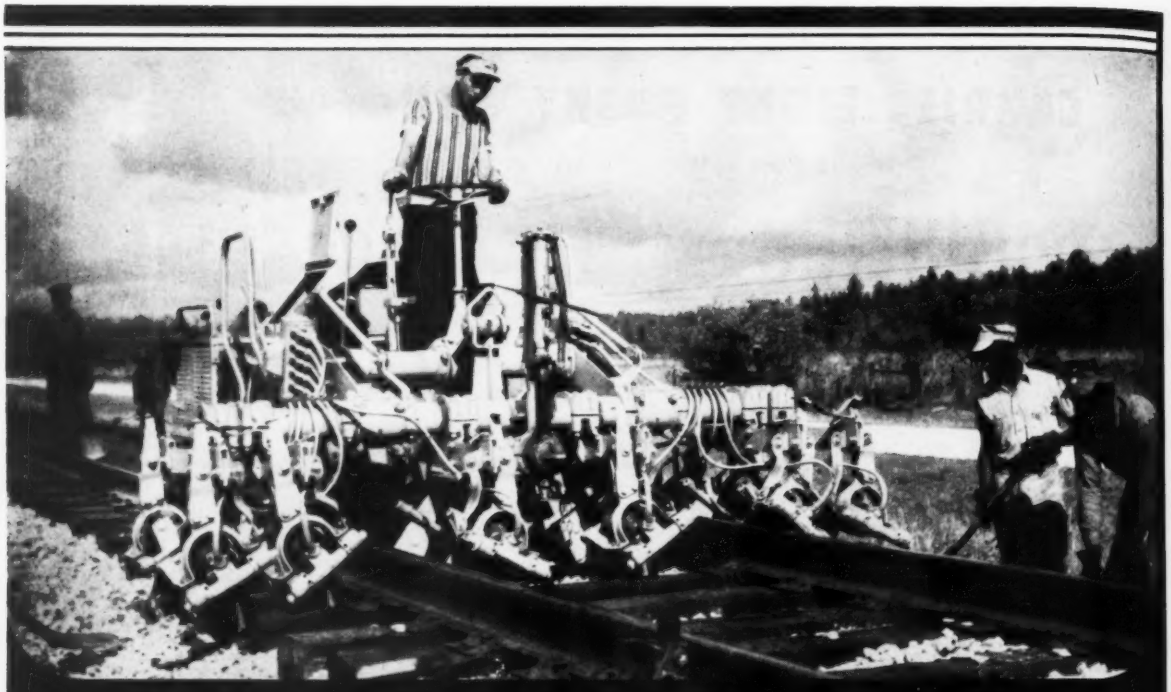
Actual load capacity 2,000 pounds — men or materials. This Fairmont A3 Series D doubles in B & B and extra gang car service. Equipped with a 17 H.P. engine, 4-speed transmission and Timken tapered roller bearings on all axles, it performs with efficiency and economy.

Timken bearings reduce friction to the minimum; carry radial, thrust and combined loads; help to hold shafts in alignment and protect them against wear. And because they are made of Timken alloy steel — the finest material ever developed for tapered roller bearings — they usually last for the life of any equipment in which they are installed. Make sure you have them in your equipment. Look for the trade-mark "TIMKEN" on every bearing.

THE TIMKEN ROLLER BEARING COMPANY
CANTON 6, OHIO - CABLE ADDRESS "TIMROSCO"

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▱ BEARING TAKES RADIAL ▯ AND THRUST ▯ LOADS OR ANY COMBINATION ✳



THE JACKSON "M-T"

——— a sound solution to the 40-HOUR-WEEK PROBLEM: ———

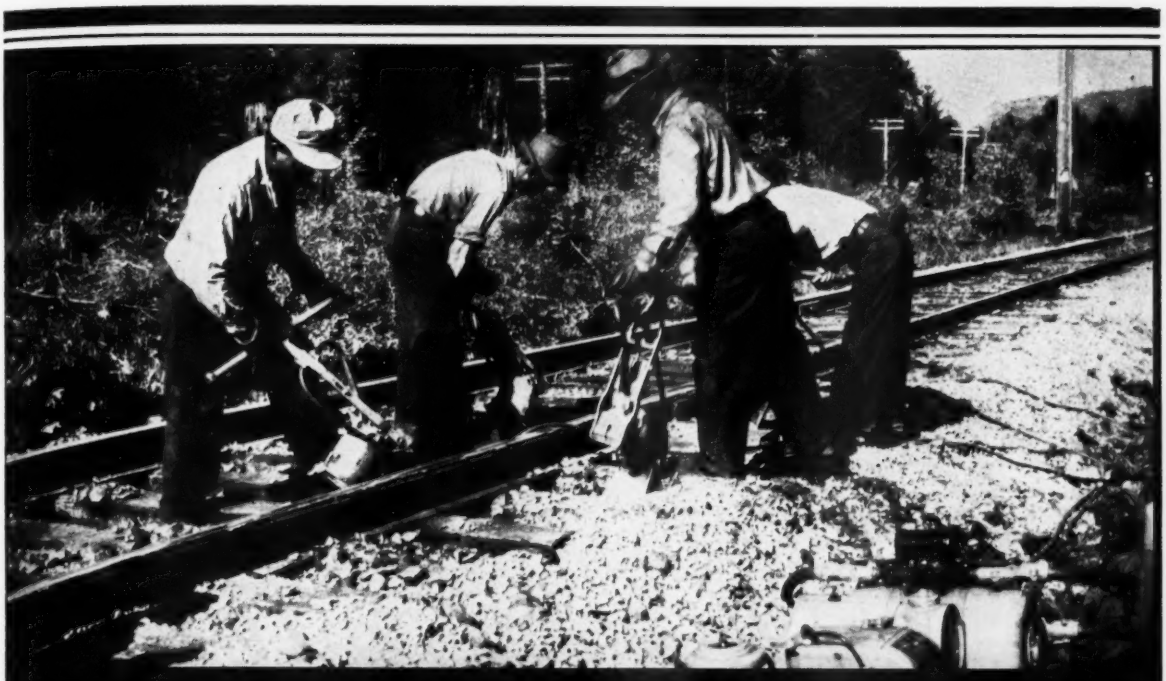
If higher pay rates and the 40 hour week appear to make adequate ballasting operations impossible within the limits of your budget, do one of two things:

1. Call in a Jackson consulting engineer — a practical individual thoroughly trained in maintenance methods and practice and one who talks your language. He can answer all your questions in short order and explain how the Jackson "M-T", operating under the conditions obtaining on your particular road, can help you to a sound solution of your problem. Or . . .

2. If you would rather simply study a Jackson "M-T" in actual operation, write for nearest location.

Prompt deliveries can be made to those who wish to capitalize on the tremendous advantages of this machine during the rest of the season. Write, wire or phone us, Now!

ELECTRIC TAMPER & EQUIPMENT CO. Ludington, Michigan



THE JACKSON 4-TAMPER OUTFIT

SECTION GANG PRODUCTION BOOSTER

Finest of Unit Tampers for Extra Gang Service

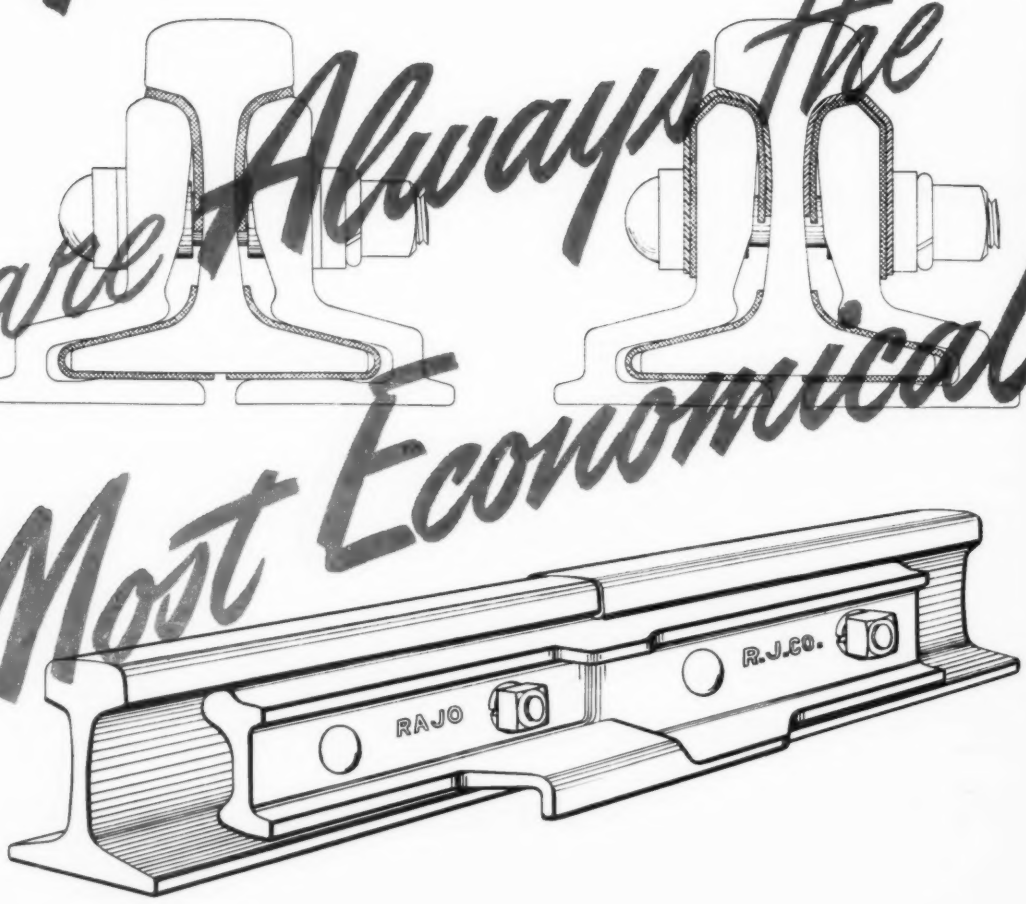
In your search for rock-bottom maintenance costs, necessitating staying within the 40-hour week, don't overlook the great boost in productivity Jackson standard tampers and power plants can give to your section gangs.

Equipped with 4 Jackson standard tampers and our Model M-2 Power Plant, a section gang will turn out a whale of a lot more work and better work than can be done by hand or with any other hand-guided mechanical tampers. For spot tamping, skeletonizing and such out-of-face surfacing as is usually done by the average section gang, the Jackson 4-Tamper outfit is truly ideal. Moreover, whenever desired these outfits can be grouped in extra gang service for a general lift or major ballast insertion — with results that are surpassed only by the multiple tamper. Get the complete facts. Write, wire or phone us, NOW!

ELECTRIC TAMPER & EQUIPMENT CO. Ludington, Michigan

The Best Rail Joints...

are Always the Most Economical



THE RAIL JOINT COMPANY Inc.

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Here's that new crane you're paying for

If you own an old steam locomotive crane, you are probably signing checks every month that could easily pay for a brand new AMERICAN DIESELECTRIC. Would you rather have the new crane, or the cancelled checks?

Here are some of the items involved in running your ancient steamer: (1) *Wasted fuel* . . . coal used while building up steam, while fires are banked at night, while crane is standing idle, or while it's running in for more coal! (2) *Wasted labor* . . . the expense of a fireman who does nothing but nurse the boiler. (3) *Wasted maintenance money* . . . the endless repair and service costs that grow steadily worse with old, worn out equipment.

In its day, the AMERICAN Steam Locomotive Crane was one of the wonders of the age. But compare it with the AMERICAN DIESELECTRIC of 1949. Using diesel power to the deck, electric power to the wheels, the DIESELECTRIC cuts fuel cost to 1/10th that of a steam crane. One man runs it. In the underbody, seven tons of wearing parts have been eliminated—so maintenance expense is cut 25% to 50%. Those factors, plus enormously greater work output, enable the DIESELECTRIC *to pay for itself in five years!*

Would you like to check these statements . . . and see exactly how the DIESELECTRIC has revolutionized the use of locomotive cranes? Mail the coupon below.

American Hoist
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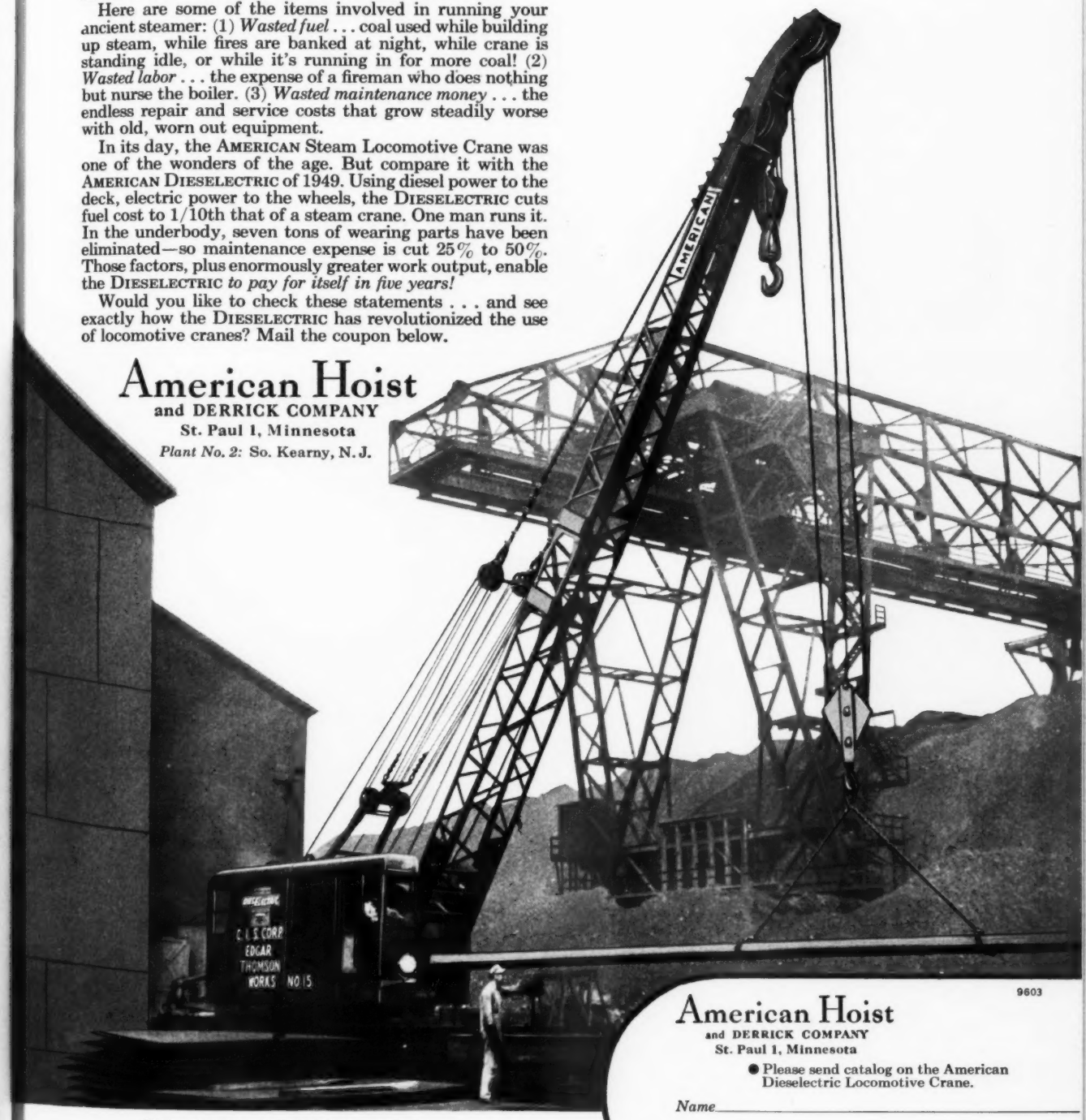
St. Paul 1, Minnesota
Plant No. 2: So. Kearny, N. J.



DIESEL-ELECTRIC LOCOMOTIVE CRANE. PATENT NO. 2083460. TOUCH CONTROL. PATENT NO. 2370858

MAIL THIS COUPON TO

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American Hoist
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St. Paul 1, Minnesota

● Please send catalog on the American Dieselectric Locomotive Crane.

Name _____

Company _____

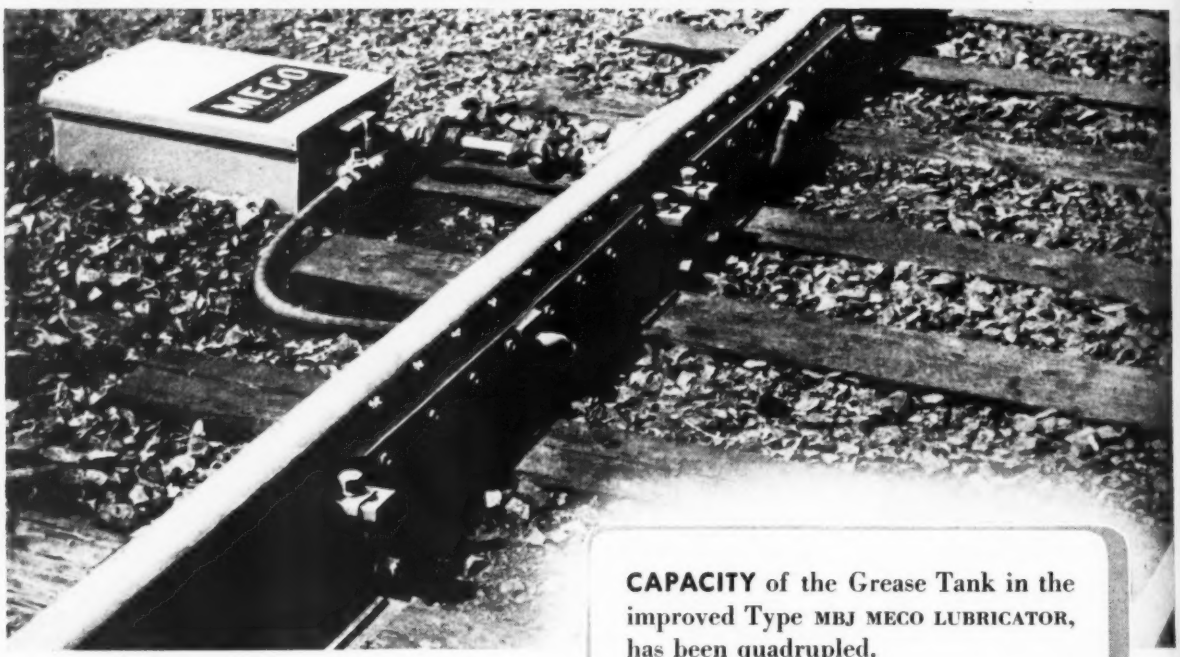
Address _____

City _____ *State* _____

31

MECO LUBRICATOR TYPE MBJ

CAPACITY



CAPACITY of the Grease Tank in the improved Type MBJ MECO LUBRICATOR, has been quadrupled.

ONE TANK FILLING LASTS FOUR TIMES AS LONG

Lubricant passages are machined throughout, resulting in ample and uniform flow of rail and flange lubricant.

Ample greasing capacity for application on larger rail sections.

Maintenance Equipment Company

RAILWAY EXCHANGE BUILDING • CHICAGO 4, ILLINOIS

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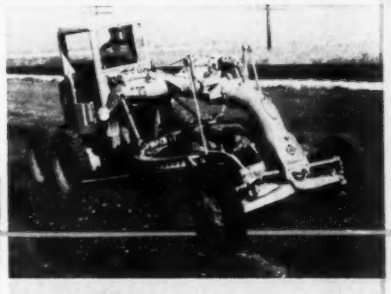
Do MORE WORK in FEWER HOURS with Allis-Chalmers off-track equipment . . .

Meet the challenge of the shorter work week. Speed up grading and maintenance many ways with off-track work equipment

Operating free of the tracks, Allis-Chalmers diesel tractors and motor graders keep working hour after hour — while trains move through on schedule. They are quickly moved from job to job by flat car, trailer or under their own power. Go into action immediately. Handle work close to or far from tracks. Operate more safely, at lower cost, and put in as much as 50 percent more working time than rail-bound equipment.

WLER TRACTORS

-Chalmers 2-Cycle Diesel Tractors with all types of auxiliary equipment ilroad construction and maintenance. instantly, operate economically on fuel. Four models—from 11,000-lb. to world's largest, 40,000-lb. HD-19 exclusive torque converter drive.



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A-C diesel-powered motor graders are heavy-duty outfits, with extra clearance, full range of blade positions. "Roll-Away" moldboard handles bigger loads faster, with less power. Four diesel models, 50.5 to 104 hp., 17,772 to 22,140 lb. — Also, the new low cost gasoline-powered Model D, with exclusive tandem drive, for lighter work.

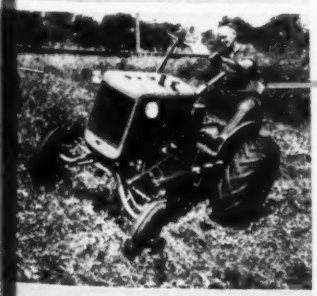
YOU'LL FIND THE RIGHT SIZE AND TYPE ALLIS-CHALMERS MACHINES

for

any off-track construction and maintenance

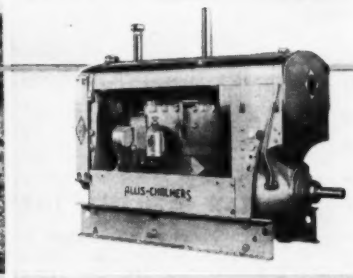
•

mowing, hauling . . . . . .
powering tools, ... etc.



EL TRACTORS

Wheel Tractors are compact, powerful. for hauling, mowing, sweeping, snow val, bulldozing loose materials. Elec- lights and starting. Model B Mower les slopes 60° above to 45° below ontal. Heavy-duty 5-ft. cutter bar is aulically raised and lowered.



POWER UNITS

A-C Power Units are high in torque, provide heavy-duty power for any requirement — steady or intermittent. Mass produced for lowest cost, along with engines by the thousands for tough tractor service. Accessories to fit application. Nation-wide service facilities. Choice of fuels. Five models, open or enclosed, 15 to 110 b.hp.

Write for complete information, or let us put you in touch with your Allis-Chalmers railroad dealer.

ALLIS-CHALMERS
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You can depend on premium performance from any product that bears the name

AMERICAN BOSCH

Winner in every field

When the green flag is down and the going's tough — that's when American Bosch *super-powered* magnetos really shine. For years, American Bosch has been building magnetos that have what it takes to make a winner — on the race track . . . in the air . . . and under the roughest farm and industrial use. It's that wealth of experience that gives American Bosch magnetos their rugged dependability, ace-high performance, and ability to deliver long years of trouble-free service. Next time you need a magneto, make it an American Bosch . . . you couldn't buy a finer magneto.

STAR OF THE INDIANAPOLIS CLASSIC

Again in '49, American Bosch magnetos proved their metal in the gruelling Memorial Day Classic. Of the first ten; — 2nd, 5th, 6th, 7th and 10th places went to cars equipped with American Bosch's latest type MJL Magneto, while the 1st, 3rd and 4th places went to cars equipped with pre-War Bosch models. The same know-how and production skill that builds these star performers of the race track are yours when you buy an American Bosch magneto for your farm or industrial engines.

AMERICAN BOSCH CORPORATION • SPRINGFIELD 7, MASSACHUSETTS

Here's the Outstanding DC Arc-Welder Development of All Time

The *New* P&H NEMA-Rated Model WFA 300

(Welding Service Range 60-375 amps)

The only DC Welder with time- and money-saving Dial-lectric control — a compact, light-weight unit that runs at the life-preserving speed of 1750 rpm.

Here's a DC welder that can reduce your welding costs . . . P&H's new model WFA 300.

Just check these features:

LIFETIME SEALED BEARINGS —no lubrication needed.

PUSH-BUTTON START AND STOP SWITCH —overload protection.

CLASS B. GLASS INSULATION — highest quality available.

COMPACT DESIGN — uses little or no floor space.

DUAL-FAN COOLING SYSTEM — the coolest welder you have ever seen.

STATIONARY OR PORTABLE MOUNTINGS.

LOWEST RPM PER POUND OF WEIGHT

QUIET — you hardly know it's running.

REMOTE CONTROL — full arc control at the work.

DIAL-LECTRIC CONTINUOUS CONTROL

POLARITY SWITCH — an extra feature at no extra cost.

HIGH-LOW RANGE — requires only a flip of a switch.

GREATER MOBILITY — only 695 lbs.

Get all the facts about this new, outstanding DC Welder. Call your P&H representative or write us for Bulletin W-80.

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Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION

WELDING ELECTRODES • MOTORS • HOISTS P&H ELECTRIC CRANES • ARC WELDERS • EXCAVATORS

Speed Bridge Maintenance with time-saving CP Pneumatic Tools

Reversible Impact Wrench, with pistol grip—CP 365-RP—saves hours in running nuts, and in applying or removing bolts, studs and lag screws.

Absence of twisting or kickback, and little vibration, provides a factor of safety and minimizes operator fatigue . . . impacting force completely rotary in action . . . force of blow controlled by regulating air pressure. For 1¼" bolt size; over-all length 16¾"; weight 32 lbs.

Boyer Rivet Buster—CP-11X—has special retaining device for quick changing of chisels and backing-out punches. With powerful 11" stroke, it has one-inch rivet cutting capacity; with chisel, it is 31" long and weighs 35 lbs.

Scaler—CP-402—has a very rapid, vibratory action that removes paint, scale and rust without damaging the metal surface underneath. No chisels are required, as the hammer piston itself acts as the chisel. Has ⅞" bore; ½" stroke; weighs 3 lbs.

Wire Brush Machine—CP-3140—speedily removes rust, scale or paint from any metal surface. Brush diameter 6". With pistol grip, over-all length 18½", weight 12½ lbs.

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.

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ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

ADDITIONAL INFORMATION

On Any of the Products Mentioned in This Issue

Below is a complete index of the products referred to in both the editorial and advertising pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and stamped postcards in requesting it. In each case give name of product and page number. The information will come to you directly from the manufacturer involved, without any obligation on your part.

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30 CHURCH STREET
NEW YORK 7, NEW YORK

READER SERVICE DEPT.

RAILWAY ENGINEERING AND MAINTENANCE August, 1949

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RAILWAY ENGINEERING AND MAINTENANCE August, 1949

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First Class Permit No. 32418, Sec. 510, P.L.&R. Chicago, Ill.

RAILWAY ENGINEERING & MAINTENANCE

30 CHURCH STREET

NEW YORK 7, NEW YORK

READER SERVICE DEPT.

No Postage Stamp Necessary If Mailed in the United States

You can count on chlorophenol treated poles and ties, too!

Probably the highest praise a railroad man can receive is to say, "he's dependable"!

Performance dependability is an important asset to any road. Railroad men are recognizing more and more that dependable preservative action is what you can expect from PENTAchlorophenol-protected poles and ties. They also like the clean treatment PENTAchlorophenol provides for walkways, platforms, loading docks and car lumber.

PENTAchlorophenol's deep penetration and low volatility add up to lasting preservative action . . . protection that lasts through the years, even under the severest climatic conditions.

Specify the PENTAchlorophenol treatment for safeguarding your crossties and poles . . . as well as sheds, platforms and other wood construction.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

DOW penta- chlorophenol

This Small Investment Pays Big Dividends!

Black & Decker 6" STANDARD BENCH GRINDER

ONLY $38.00

- **Speeds Up** all "run-of-shop" grinding; tool sharpening; removing rust, old paint; cleaning metal; many maintenance jobs!
- **At This Low Price** you can use several to spot around shops. Keep them handy to mechanics. Save steps, save time!
- **Many Practical Features** you wouldn't expect to find at such a *low price*—constant speed motor; adjustable tool rests, etc.

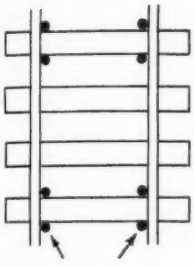
FOR BETTER, FASTER WORK, the price of a Black & Decker 6" Standard Bench Grinder is the best $38.00 you'll ever spend! Order yours today from your nearby B&D Distributor. Write for free catalog to: The Black & Decker Mfg. Co., 663 Pennsylvania Ave., Towson 4, Maryland.

LEADING DISTRIBUTORS EVERYWHERE SELL

Black & Decker

PORTABLE ELECTRIC TOOLS

You can Save $5.28 Per 39 ft. Panel of Track!



Conventional Anchor

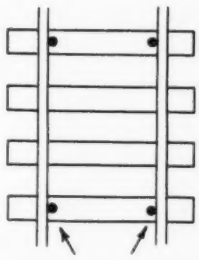
Comparable costs of boxing 8 ties with conventional anchors, and with NO-CREEP anchors.

In each case, 8 ties per 39 ft. panel are anchored TWO ways.

Using Conventional Anchor	
32 anchors, estimated cost	$9.60
Using NO-CREEP Anchor	
16 anchors, cost	4.00
Plus welding (if we do welding) 2c per anchor	.32
Total cost	4.32
Savings on anchorage cost	$5.28

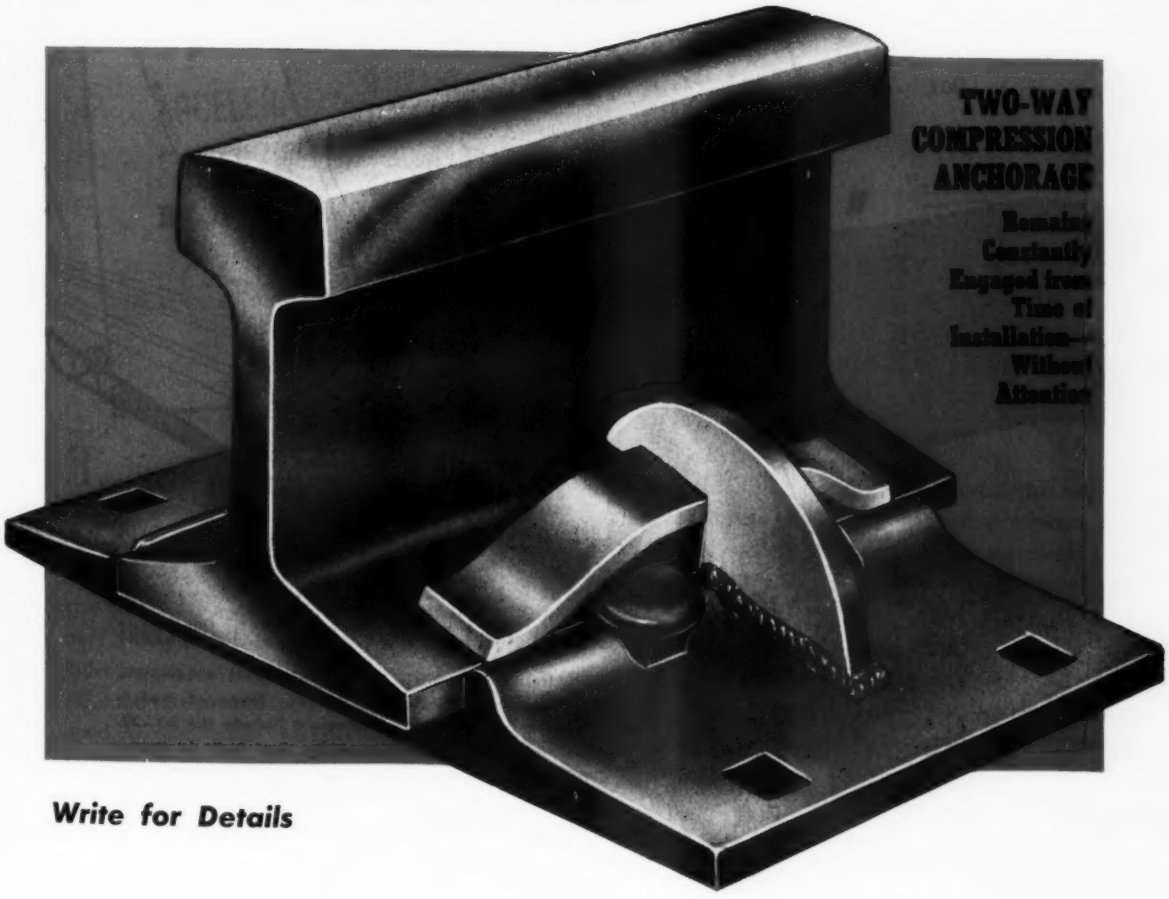
Plus . . . additional savings through elimination of maintenance.

Figure these savings against your track program for 1950. Also bear in mind that when using the NO-CREEP Anchors you eliminate the annual cost of resetting or adjusting anchors.



Our 1-piece 2-way Compression Anchor

Use The NO-CREEP RAIL ANCHOR!



Write for Details

G&H RAIL CONTROLS, INC.

Phone BE 8117 **5204 Truman Road** **Kansas City 1, Mo.**

BROWNHOIST'S 1949 DIESEL ELECTRIC LOCOMOTIVE-CRANE MARCHES IN THE PARADE OF BROWNHOIST *FIRSTS!*

PIONEERS IN DEVELOPMENT OF DIESEL POWERED CRANE IN 1928
FIRST ELECTRIC LOCOMOTIVE-CRANE 1901
THE FIRST GAS-ELECTRIC LOCOMOTIVE-CRANE 1929
MORE THAN FIVE HUNDRED DIESEL POWERED CRANES IN SERVICE
FOR 25 YEARS BUILDERS OF MORE THAN 20,000 CRANES (15,000 STILL IN SERVICE)
THE WORLD'S LARGEST CAPACITY DIESEL POWERED RAILROAD CRANE
DIESEL ELECTRIC

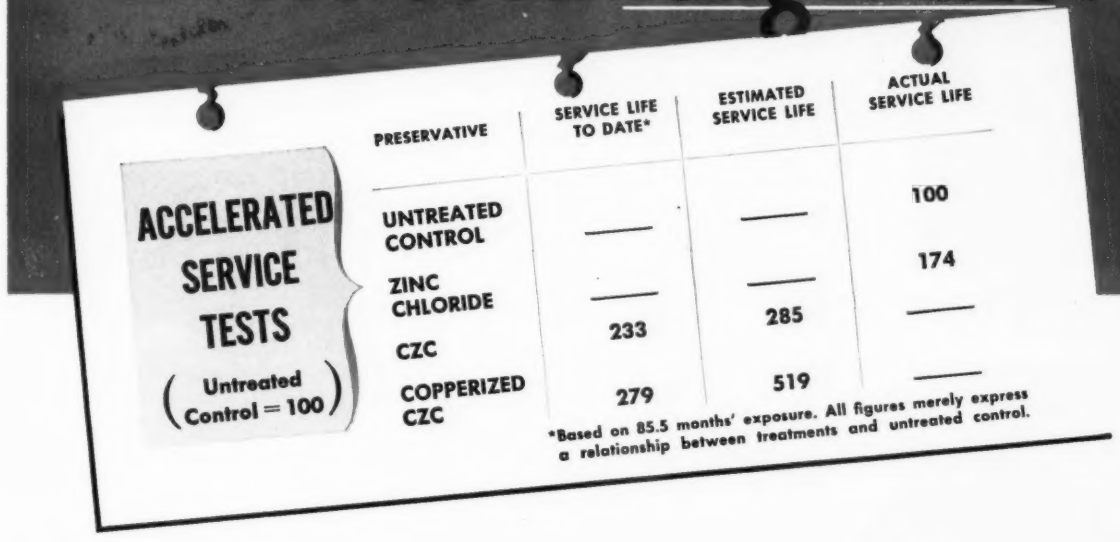
NEW BROWNHOIST DIESEL ELECTRIC LOCOMOTIVE-CRANE

Continuing their firsts, Brownhoist *alone* offers a complete line of Diesel Electric Locomotive-Cranes. Standard models available for every capacity requirement include the D.E.-30, D.E.-50, D.E.-60; special larger capacity sizes built to order. Write for complete information and literature.

INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN

DISTRICT OFFICES: New York, Philadelphia, Cleveland, Chicago. **AGENCIES:** Detroit, Birmingham, Houston, Los Angeles, Portland, San Francisco, Seattle, Spokane. Canadian Brownhoist Ltd., Montreal, Quebec.

Announcing—
COPPERIZED CZC-TREATED WOOD
for even longer life!



THANKS TO an improved preservative formulation, Copperized Chromated Zinc Chloride, you can count on greater service life from salt-treated wood.

This new formulation . . . the product of cooperative research by chemists of E. I. du Pont de Nemours & Co., Inc., and Koppers Company, Inc. . . . provides longer service life than Chromated Zinc Chloride, the salt preservative from which it was developed. Accelerated service tests bear this out, as shown in the accompanying table.

While adding extra years of service, this new preservative retains all the outstanding advantages of CZC. It is decay resistant, termite repellent, clean, odorless and paintable. There is no loss of strength in wood treated with Copperized CZC.

You'll add years of service to car lumber, platforms, roof decking and other installations, by using wood pressure-treated with this new COPPERIZED CZC. It's a worthwhile investment . . . investigate it today.

KOPPERS COMPANY, INC.
Pittsburgh 19, Pa.

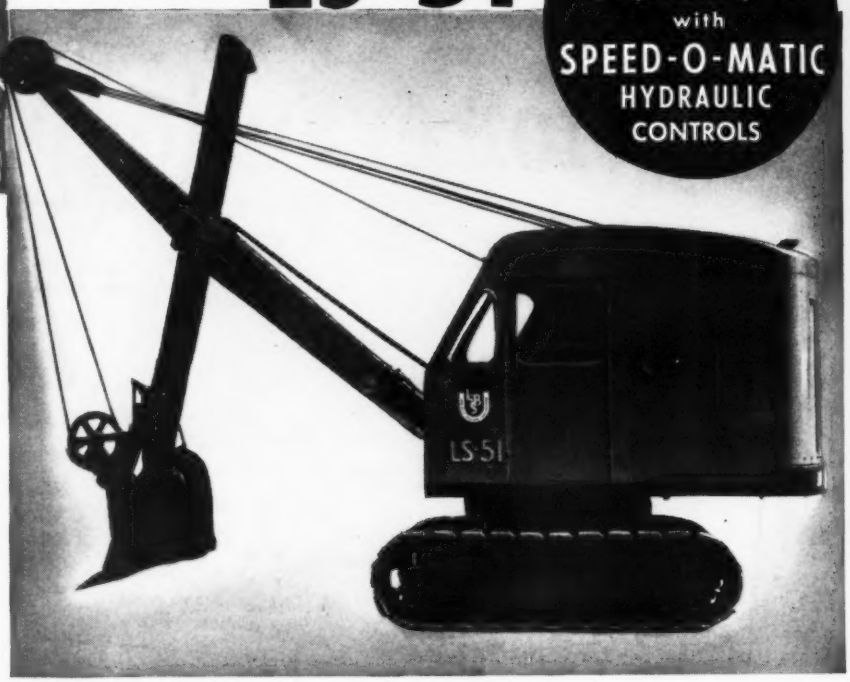
KOPPERS PRESSURE-TREATED WOOD

LINK-BELT SPEEDER

Proudly Presents

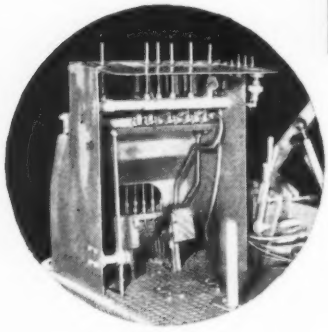
A NEW SHOVEL-CRANE the LS-51

½ YARD capacity... with SPEED-O-MATIC HYDRAULIC CONTROLS



FINGER-TIP CONTROL THAT BOOSTS OUTPUT UP TO 25%

Fast acting, effortless Speed-O-Matic control banishes operator fatigue, keeps output at peak throughout entire shift. Operator has "feel" of the load at all times! Tests prove —



Power Control at its Best!

One lever controls forward crowd and retract of shovel. One lever controls hoist and dump. Variable pressure valves operate hydraulic cylinders to the exact degree desired. No slamming, grabbing, chattering! Minimum attention, negligible upkeep!

UP TO 25% HIGHER PRODUCTION!

Here's a New Yardstick for Measuring ½ Yard Shovel-Crane Performance!

For the first time, you are offered a half-yard shovel-crane with the time-tested, performance proved Speed-O-Matic controls, formerly available only on 1½ yard or larger machines. Speed-O-Matic hydraulic control, plus complete modernization of all construction details, puts the LS-51 in a new class of construction machinery. Faster operating cycles, precision control of every movement, elimination of operator fatigue will boost production up to 25% over manually controlled shovel-cranes of the same rating. Absence of mechanical linkage simplifies servicing and greatly reduces maintenance.

Visit your nearby Link-Belt Speeder distributor. See for yourself the numerous features that make the LS-51 a new yardstick for measuring half-yard shovel-crane performance.

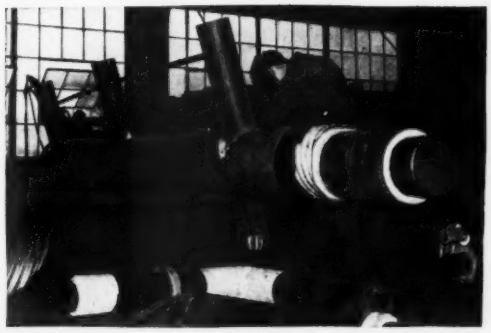
11,577

LINK-BELT SPEEDER

LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS, IOWA

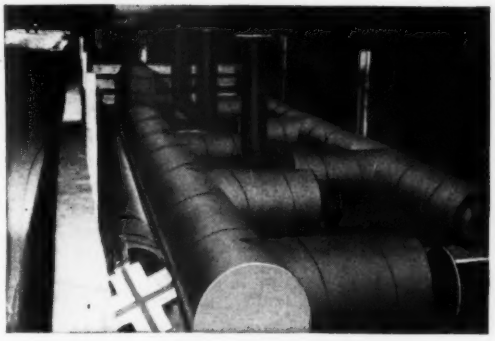
Builders of the Most Complete Line of SHOVELS-CRANES-DRAGLINES

Pre-Insulated FABRICATED PIPING *Pre-Sealed*



Units are completely fabricated and insulated at the Ric-wiL plant . . .

and are shipped ready to install with single-handling upon arrival.



by RIC-WIL *FOR OUTDOOR USE* Underground or Overhead

● An exclusive, outstanding feature of Ric-wiL Pipe Units is the fact that they are not only prefabricated but are also completely *insulated* in the Ric-wiL plant and are shipped ready for immediate, *single-handling* installation, per plans and specifications.

Ric-wiL Foilclad Units, with pipe and insulation coated with asphalt and wrapped with aluminum or copper foil, are supplied for overhead single-pipe lines. For underground lines or overhead multiple pipe systems, or wherever high strength conduit is required, Ric-wiL supplies units in which piping and insulation are housed in Helcor conduit. This helically corrugated galvanized iron conduit is full welded and pressure tight and covered with a heavy coating of asphalt and a wrapping of asphalt saturated asbestos for complete protection.

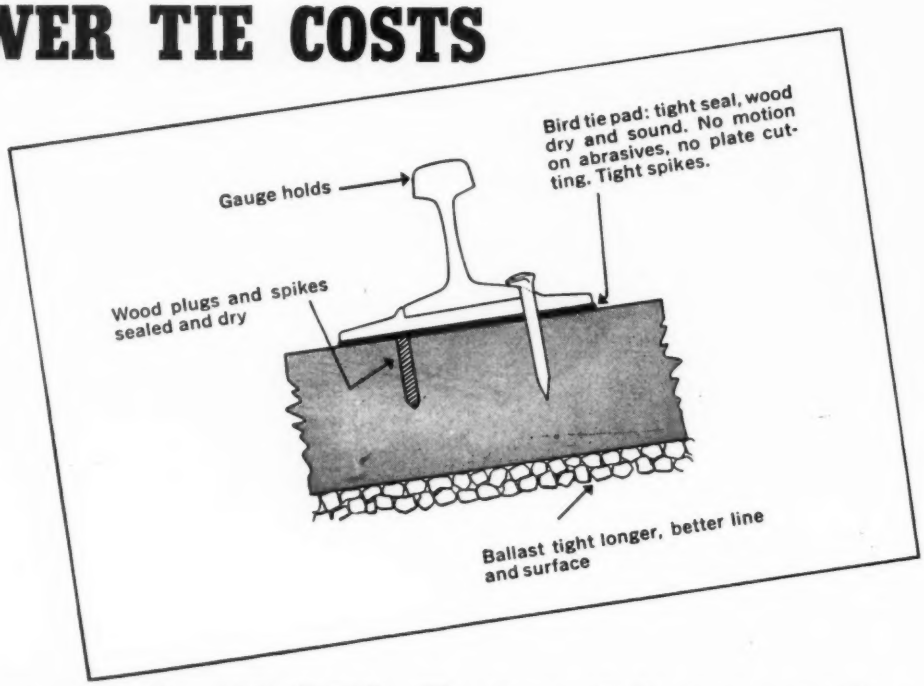
Either type unit is furnished complete with expansion loops, fittings, etc., in the same design, ready for field installation in minimum time and at minimum cost. In multiple pipe units, pipes may be insulated from each other or from the exterior only, as in the type of unit used for transmission of oil and process liquids. No matter how complicated the requirements of an individual job, Ric-wiL is equipped to prefabricate and insulate in the factory, to meet individual plans and specifications.

The insulated pipe headers shown above are typical examples. Designed for a system of piping actified and foul solutions, they required special insulating and cutting, mitering and welding of pipe with flanges and conduit. One 28 ft. unit comprises 3 tee branches, 1 Y branch, 2 reducers and 4 slip-on flanges welded to the pipe. Only work required at job-site was simple connection of header to adjacent equipment.

If you have overhead or underground piping problems get helpful information by writing The Ric-wiL Co., Dept. 13 P

RIC-WIL
INSULATED PIPING SYSTEMS
THE RIC-WIL COMPANY • CLEVELAND, OHIO
REPRESENTATIVES IN PRINCIPAL CITIES

LOWER TIE COSTS


Bird tie pad: tight seal, wood dry and sound. No motion on abrasives, no plate cutting. Tight spikes.
Gauge holds
Wood plugs and spikes sealed and dry
Ballast tight longer, better line and surface

Because the Bird Tie Pad seal keeps under plate wood dry, sound and clean!

The Bird Tie Pad seal eliminates the three major factors that combine to cause under plate tie failure . . .

Bird Tie Pads form a water resistant seal . . . under plate and spike hole wood is kept dry and sound.

Bird Tie Pads form a tight seal . . . plate motion against the wood is eliminated.

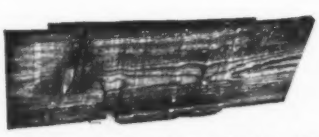
Bird Tie Pads form a dustproof seal . . . the entry of sand and other abrasives is prevented—the elimination of both motion against the wood and abrasives removes the two factors causing plate penetration.

Savings on cross tie bills from tie life extension alone will usually run in the order of 20 per cent . . . more on expensive bridge and switch ties and fast wearing points such as sharp curvature. Even greater savings are possible! Bird Tie Pads reduce labor required to maintain gauge, line and surface, and make smaller tie plates thoroughly practical . . . superior in performance to larger plates without pads.

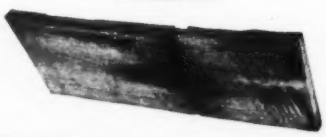
The above statements are based on ten years of in-track experience and research. We believe they are justified by the facts which we have developed. Let us tell you more about this important development—write Bird & Son, inc., 12 Birch Street, East Walpole, Massachusetts.

BIRD TIE PADS

East Walpole, BIRD & SON inc. *Massachusetts*



Vertical cross section from typical Bird Tie Pad installation . . . clean, dry, sealed wood and spike hole.



Tie without pad in early stage . . . surface wood is checking and breaking up. Notice stained wet area around spike hole.

Tie without pad in advanced stage . . . moisture softened, broken down spike hole and surface wood, and deep plate penteration.

Light-Simple-Effective

RACINE UNIT TIE TAMPER

Saves Labor, Time and Tempers

WHY USERS LIKE RACINE TAMPERS

★ **Light in weight — Less than 60 lbs.**

★ **Patented, special alloy spring assembly throws the hammer and cushions the recoil. No shock on operator. No manual pressure needed to compact ballast.**

★ **1500 high velocity blows per minute, combine with stirring action for fast, effective work in all types of ballast.**

★ **Tamping bars last longer — because they are protected by inherently balanced blow and recoil, and a rubber cushioned tool holder head.**

★ **Maintenance cost is low — extremely simple assembly of few working parts, reduces replacements and repairs below all previous standards.**

Three years of field service prove the RACINE Unit Tamper superior. It is lighter in weight, easier to carry, trouble-free and long-lived.

The unique, patented, special alloy spring assembly, creates a sling-shot like action. All the operating shock is contained within the machine, the operator remains steadily at work without fatigue.

Easy starting in heat or cold. Ready for work within seconds after pulling built-in starter cable. Magneto ignition — no batteries to fail or be lost. Lubricated by oil in gasoline. Fumes exhausted from engine — none through operating mechanism and sliding ways to cause carbon and wear.

Fully guaranteed — performance qualities have been demonstrated by three years of laboratory and field tests as well as continuous use under varying working conditions across the country. Complete information supplied to maintenance men without cost, obligation or high-pressure sales follow-up.

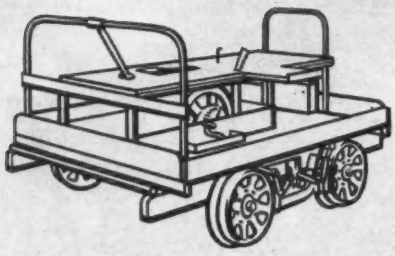
WRITE TODAY FOR INTERESTING CATALOG

STANDARD FOR QUALITY AND PRECISION
RACINE TOOL and MACHINE CO.

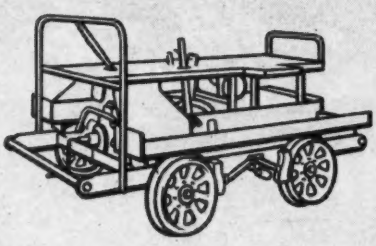
RACINE TOOL AND MACHINE COMPANY

1738 State St., Racine, Wis.

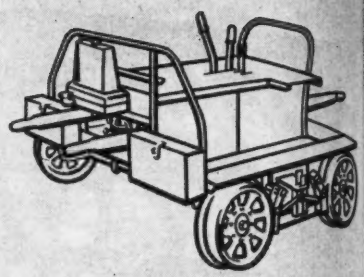
★STANDARD FOR QUALITY AND PRECISION



Model 44-B
Standard section car on many roads; powered to haul trailers with men, tools and/or ties.



Model 40-B
Heavy-duty section car; four speeds forward and reverse.



Model 57-D
One-man inspection car; light, fast, dependable.

The longer the ride
The better you'll like 'em...

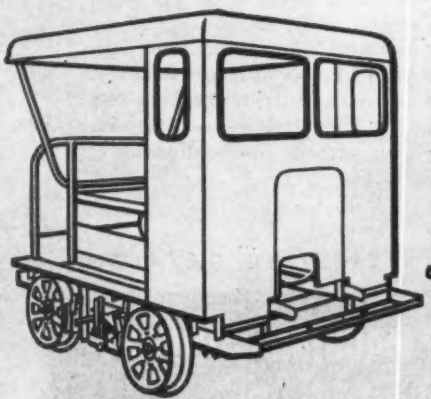
Rail cars built the way railroad men want them . . . with ample power, more convenience and added comfort that make short rides a snap, long rides a pleasure . . . Fairbanks-Morse rail cars . . . first on the roads, *and still* first! Fairbanks, Morse & Co., Chicago 5, Ill.

When it comes to railroad equipment . . .

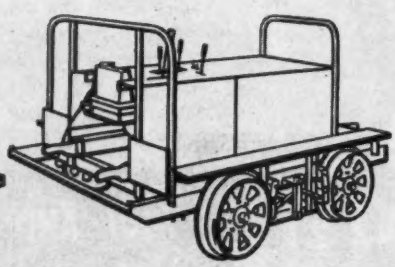
FAIRBANKS-MORSE

A name worth remembering

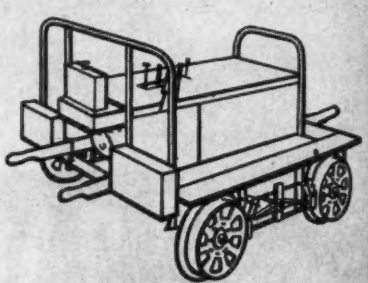
DIESEL LOCOMOTIVES • DIESEL ENGINES • PUMPS • SCALES • MOTORS • GENERATORS
STOKERS • RAILROAD MOTOR CARS and STANDPIPES • FARM EQUIPMENT • MAGNETOS



Model 53
6-to-8 man standard section car showing comfort-adding metal cab.



Model 58
Light section car; for 6 to 8 men.



Model 54-D
1-to-4 man inspection car; powerful brakes.

what's the best way

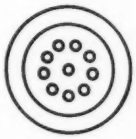
Heat treating rail ends

to recondition rail ends . . . frog points . . . faster . . . at lower cost

Building up frog points

— Use the new Airco Style 739 Multi-flame tip

Enlarged view of flame end of Style 739 Multi-flame tip, size 10. Also available in sizes 6 and 8.



Because with this new Airco "engineered" tip there is a more efficient transmission of heat to the work. Its speed, ease-of-operation and ease-of-handling has been pronounced excellent for welding, brazing, heating and rail end hardening operations. This durable, lightweight tip—known as Airco Style 739—has proved itself on various railroads throughout the country.

For a free demonstration of, or further information about, the new Airco Style 739 Multi-flame tip, write your nearest Airco office. (In Texas: Magnolia Airco Gas Products Company . . . On West Coast: Air Reduction Pacific Company.)

Costs Come Down Under The Airco Plan

AIRCO

AIR REDUCTION

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No. 248 of a Series

Railway Engineering and Maintenance

SIMMONS-BOARDMAN PUBLISHING CORPORATION 79 W. MONROE STREET CHICAGO 3, ILL.

Subject: Chicago, September 12-14

August 1, 1949

Dear Readers:

For most of you, the most constructive suggestion I can throw out at this time is that – if at all possible – you plan to attend the forthcoming concurrent annual conventions of the Roadmasters' and Bridge and Building Associations in Chicago, September 12-14. Never were these associations more needed than they are today, and never were they in a better position to help you in the solution of your problems.

The conventions this year will again be held at the Hotel Stevens, both associations meeting separately for the most part, but coming together in three joint sessions to hear outstanding speakers on subjects of common, pressing interest. Related features, including inspection trips to a modern timber preservation plant and an up-to-the-minute frog and switch shop, the joint annual banquet to be tendered by the Track Supply and Bridge and Building Supply Men's Associations, and the Railroad Fair on Chicago's water front, should combine to make your attendance at the conventions not only profitable, but pleasant.

There will be no exhibit of the manufacturers this year, but Railway Engineering and Maintenance will fill this gap, in part at least, in its September issue – copies of which will be distributed to all in attendance at the conventions – by including in that issue a pictorial exhibit of products of an unusually large number of manufacturers. For this exhibit we have solicited from nearly 200 companies photographs of the more important machines, power tools, materials or other products that these companies would have on display if there were to be an actual exhibit.

Furthermore, we will again preprint in full all of the committee reports of both associations, binding them into the copies of the September issue to be distributed at the convention. In these features we hope to contribute materially to the success and spirit of the meetings this year, and to make them of maximum value to you.

There always are, and no doubt will be again this year, reasons why many of you may think you can't spare the time to attend these conventions. If these reasons be your many problems, including the new problems arising out of the shorter work-week beginning September 1, you should reconsider, for the very existence of these problems, and the need for their early and effective solution, make your attendance at the conventions this year more important than ever.

Sincerely,

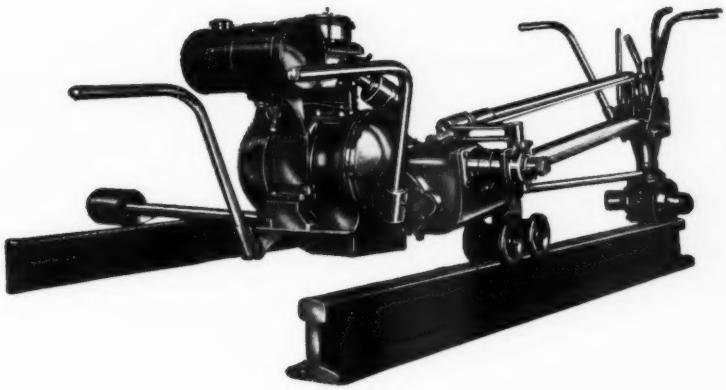
Neal D. Howard

NDH:ag

Editor

MEMBERS: AUDIT BUREAU OF CIRCULATIONS AND ASSOCIATED BUSINESS PAPERS, INC.

DE-BUGGING



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After three and a half years of such general use, the constructive suggestions from railroad engineers having ended several months ago, we feel that the Raco Track Wrench is now the nearly perfect machine.

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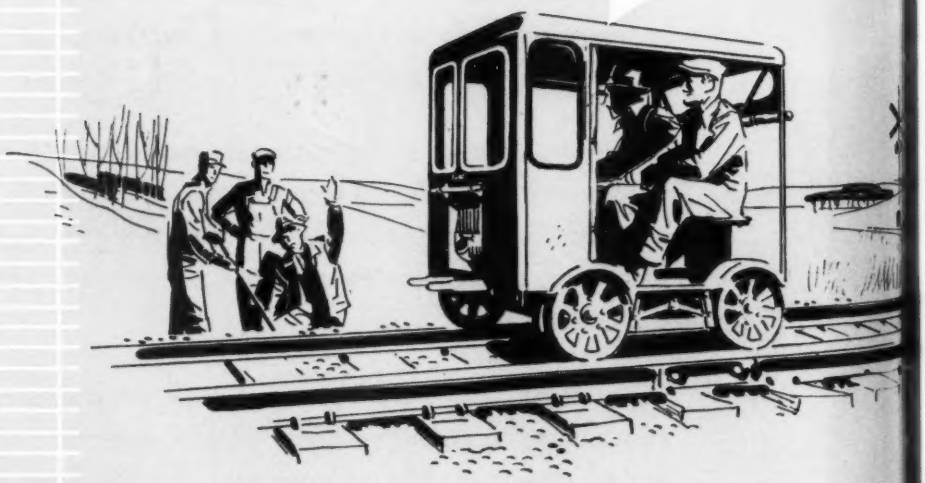
protection and safety

aluminum cab top



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No piece of Fairmont motor car equipment is ever considered our "final version." Constant effort is applied to the problem of making all Fairmont equipment progressively better, more efficient, safer, easier to use. Typical of this search for the better is the aluminum cab top which is available for Fairmont inspection motor cars (steel cabs available for section and gang cars). The addition of this accessory adds to the inherent safety and practicality of Fairmont cars—makes them even more useful as day-by-day tools on all railway maintenance assignments. As always, this accessory grew out of Fairmont's 40-year adherence to the idea that "Performance on the Job Counts." Fairmont Railway Motors, Inc., Fairmont, Minn.

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Railway Engineering and Maintenance

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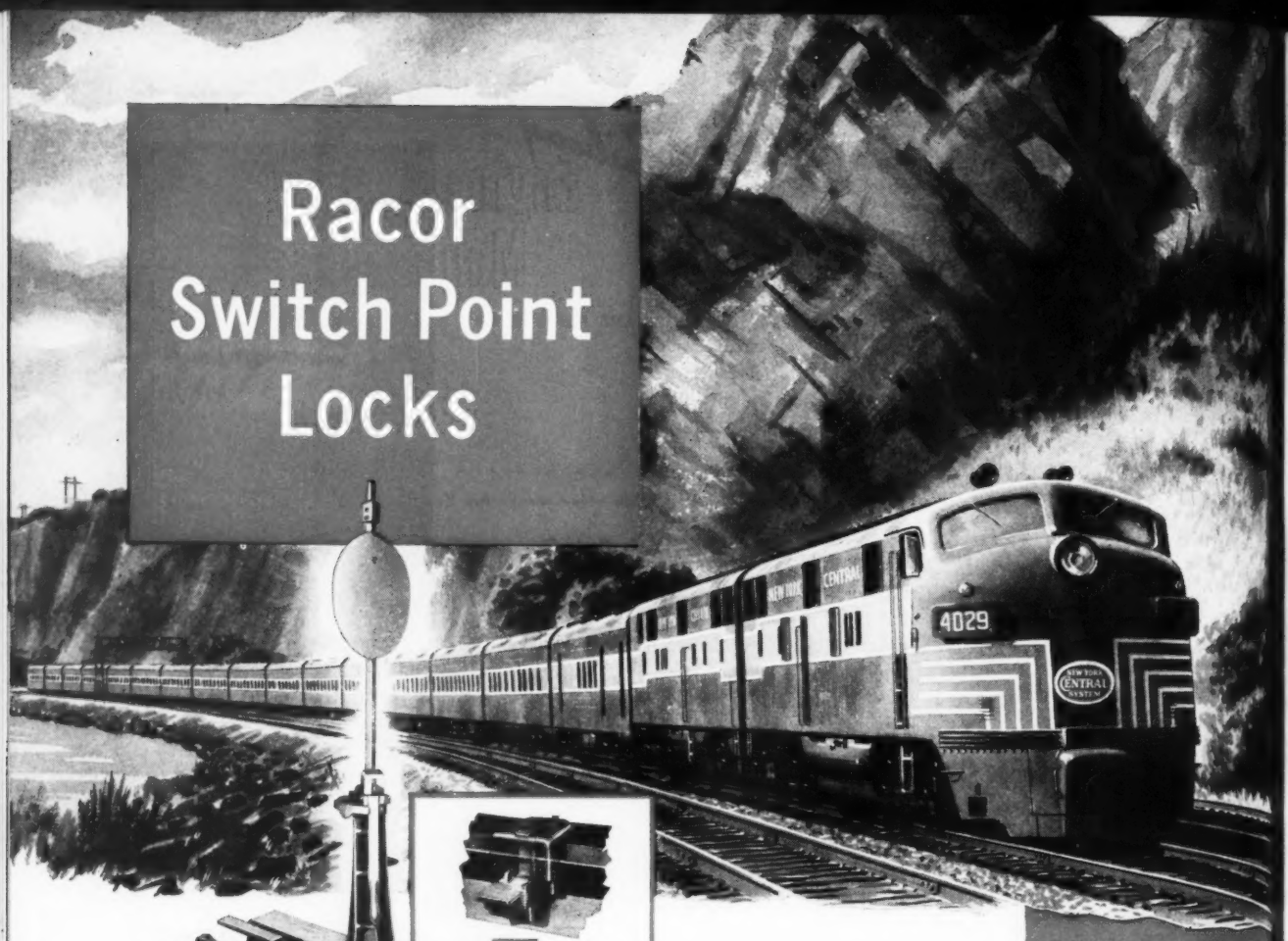
Racor Switch Point Locks



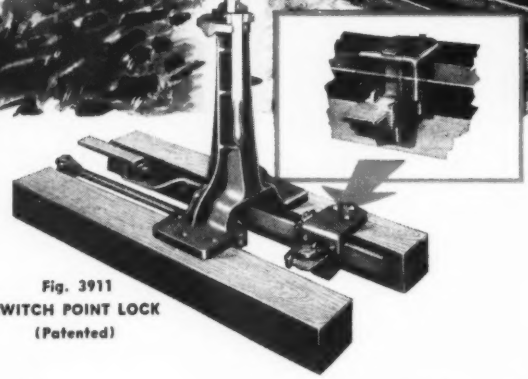


Fig. 3911
SWITCH POINT LOCK
(Patented)

Provide added protection for New York Central's passenger train operation.

Essential to the safe operation of these trains, facing point switches must be secured in a closed position, regardless of failure or damage to the throwing mechanism. Racor Switch Point Locks can be installed with all designs of main line switch stands. Ruggedly designed — easily installed below top of ties as protection against damage, they function independently of stand.

Fig. 3911 (illustrated) for use with all types of column throw stands.
Fig. 3912 available for use with all types of ground throw stands.

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Two Drastic Bills—

Would Put Railway Operations Under Government Control

The railroads, their employees, their customers, and the public generally, should be deeply concerned about two similar bills before Congress (Senate—S. 238, and House of Representatives—H. R. 378), which, if passed in their original form, would be costly to the railroads; stifle initiative by government regulation of all railroad operating rules; necessitate higher costs to railroad users; and be another broad step toward government control of private enterprise.

The two measures, as originally recommended to Congress by the Interstate Commerce Commission, would broaden the present authority of the commission as contained in Section 25 of the Interstate Commerce Act (which includes provisions of the so-called Signal Inspection Act), to include authority over all "rules, regulations, and practices with respect to the operation of trains intended to promote safety of railroad operation — — —." If the proponents of this legislation were right in what they have said about the meaning and effect of this legislation as proposed, it would give the government power to say how trains should be run, how tracks and bridges should be built and maintained, what clearances should be fixed, and how everything else connected with the physical operation of the railroads should be done. In short, the government would receive authority to run the railroads, without any responsibility for the results—which could be anything but pleasant for everyone concerned.

Rightfully, this proposed legislation has been attacked in congressional hearings by railway executives and representatives of the Association of American Railroads as undesirable, unnecessary, unjustifiable and bureaucratic, with supplemental statements that blasted arguments of proponents of the measures to the effect that the railroads countenance rules violations, and have had to be forced to inaugurate or install practices or devices in the interest of public and employee safety. Among other things, those opposing the legislation were able to show that rail transportation is far safer than any other form of public transportation; that, moreover, for the last 30 years or more the railroad passenger safety record has shown striking improvement; that the same kind of improvement has been made in the accident records of employees; that since 1923 the railroads have spent more than $15 billion for improvements to their facilities and equipment—almost every dollar of which has contributed to safer, as well as more efficient operation; that rather than encourage or acquiesce in rules infractions, the railroads, under the best qualified men in the industry, have utilized every available means to enforce observance of operating rules; and that, contrary to what some of the proponents of the measure would lead one to believe—that the railroads have had to be pushed by legislation into many of their present safety practices—the roads have spent millions upon millions, voluntarily, for safety devices and systems.

In the light of such testimony, without abandoning its quest for authority over all railroad operating rules, the commission proposed on July 6 what it termed "clarifying" amendments to the proposed legislation, which, temporarily at least, would represent broad retreat from the authority sought. As modified by the amendments, the proposed legislation would still give the commission authority to require the installation of radio and other train-communication systems, but its authority to prescribe train operating rules would be limited to rules "in connection with" such installations, and installations of signaling devices over

which it already has authority under present law. This trimmed-down version is still objectionable to the railroads. J. Carter Fort, vice-president and general counsel of the A.A.R., has said that the "clarifying" amendments would not bring the bill (S. 238) to a point where the carriers could "go along with it," although the amendments do "improve" it "a great deal."

Every informed railroad employee knows that there is no need for this legislation in any form. They know that the railroads are sincere and energetic in their interest in public and employee safety; that an honest attempt is made to enforce rules and regulations; and that experienced railroad officers, actively engaged in railroad operations, are in a better position to set up and administer operating rules than men in any other group, no matter how well intentioned.

Whether the "clarifying" amendments proposed by the I.C.C. will be accepted by Congressional committees is still uncertain as this issue goes to press, but it is inconceivable that—if the bills are to be brought to a vote in Congress, their provisions should go beyond the "reconsidered recommendations" of the commission. The hope of the railroads, their employees, and the public should be that both bills are killed outright. What the railroads need is less regulation, rather than more, with more equitable treatment between competitive forms of transportation. Furthermore, they should be permitted to earn enough, and keep enough of what they earn, to be able to spend still more money for those things—widely selected—that will not only enhance safety, but will also benefit their customers, the public, their employees, and their owners.

NEW IDEAS—

Must Be "Sold" to Men in the Field

FREQUENTLY gang foremen or supervisors, or even "higher ups" in the maintenance department, will confide in others that they are opposed to some new policy or practice that they have had to put into effect on instructions from their superiors. Obviously there will be occasions when things that are distasteful to everybody must be done, and these frequently cannot be avoided. But where new practices or policies intended to promote efficiency or to be beneficial in other respects are resisted or opposed by those who must put them into effect, an unhealthy situation is created.

Is there a maintenance man who has not had experience with such situations? Probably the most common example is afforded by the resistance to machines that was widely encountered when they were first being introduced. Men opposed to machines could hardly be expected to use them properly or to give them the care required to get the best results. The same applies to new types of track fastenings, to changes in gang organization, to new ways of doing particular jobs, and to many other things. As a result of opposition in the field many a worthy idea has been given a "black eye," causing the railroad to be deprived of important savings or other benefits.

To avoid this resistance on the part of subordinates an effective "selling" job must be done when a new policy is contemplated. Quite likely an explanation of the savings or other advantages that are expected to be realized will be all that is needed. If questions are raised they should be given every consideration and answered as completely as possible. Such a policy is likely to bring infinitely better results than one based on a "there-it-is-now-use it" attitude. On the other hand those in the field who find themselves on the negative side when something new is being introduced should endeavor to put their thinking on an impartial plane in order to be certain that their attitude is based on sound reasoning and not prejudice or preconceived notions.

Thus, whether a new policy is to be given a fair trial will be determined by the manner in which it is presented to the field forces and by the reception it receives from them. And only by giving new ideas a fair trial can the best interest of the railroads, and of their employees, be served.

ARE YOU READY—

For the Trials that "F-Day" Will Bring?

THE MAINTENANCE of way departments of the railroads will wind up the month of August in a flurry of activity, making final preparations for placing the 40-hr. week into effect. On some roads this activity will consist of putting the finishing touches on plans that have been gradually thrashed out during the last weeks and months; on others important decisions that have been postponed as long as possible will now *have* to be made.

On September 1 all maintenance men, from the ranks upward, are going to wake up into what, in some respects at least, will be a new world. They are going to have to familiarize themselves with new working hours, schedules and agreements, all markedly different from those that will be in effect at the close of business on August 31. There are two courses that individuals have open to them in getting acquainted with this new world; they can wait until Thursday, September 1, and start groping their way around, or they can begin now (if they have not already done so) to orient themselves with respect to all the changes that will take place.

But there is another respect in which reorientation will be necessary—and that is in the general attitude toward efficiency and economy. The situation shaping up is one in which maintenance men will have to deal with the upper millstone, represented by rising costs, and the nether millstone, represented by the need for economy. And there is a third millstone, too—in the form of maintenance standards that *must not* be allowed to deteriorate. While many such men will insist that the methods they are using now are the most efficient and economical that can be devised, they will be called on to do even better in the future.

"F-day" is not an event toward which those responsible for the maintenance of railroads' fixed properties are looking forward with pleasure. But they will find that the headaches attached to it will be minimized if the effective date is preceded by a sincere effort to anticipate—and adjust to—the new problems and situations that will arise.

One of the two reinforced-concrete firestops nears completion as a deck slab is being moved into place under the jacked-up track

Pontchartrain Trestle Gets CONCRETE FIREBREAKS

Careful planning and meticulous attention to field details kept freight and passenger trains moving on schedule during the installation of two 45-ft. reinforced-concrete firebreaks included in the reconstruction of 1,500 ft. of the Southern's long trestle across Lake Pontchartrain, just north of New Orleans, La. This article gives details of the construction employed and tells how the work was done.

Falsework bents were driven to support the piles and slabs during construction

• Fire, a relentless enemy of timber trestles, is being thwarted again. This time its insatiable appetite will be checked in the Southern's 5.9-mi. single-track timber trestle across Lake Pontchartrain, near New Orleans, where, in a current renewal program, involving the complete rebuilding of 1500 ft. at the south end, two positive concrete firebreaks have been installed. Each of the firebreaks consist of two concrete, ballast-deck spans, supported on double-concrete-pile bents, with concrete caps poured in situs. Each of the two spans in each firestop consists of two half-deck-width, precast, reinforced concrete slabs, 22½ ft. long, placed side by side. Each of the double bents contains two rows of three precast piles, each 20 in. square, 70 ft. long, and weighing 14 tons.

In preparation for the construction of each concrete firestop, special timber falsework was constructed along both sides of the trestle, directly at the firestop location, to support, first, the precast piles, and later the slabs, while awaiting their installation. This falsework consisted merely of two timber batter piles driven generally in line with and outside of each existing timber bent, with timber caps which were tied into the old bent caps for stability. The 70-ft.

Both the derrick and crane were used to transfer the 14-ton piles from a car to the falsework to keep from damaging them

The crane holding a pile vertically as its point was guided into the template

concrete piles were hauled to the site in a work train and were unloaded onto the falsework by a steam locomotive crane and a wreck derrick.

Templates Guide Piles

To locate the piles accurately in each bent, two wooden templates were used, one near the trestle deck and the other near the water line. Preparatory to driving the piles, both the derrick and locomotive crane, working together, picked up each of the piles, in turn, with cable hitches made at predetermined points. After a pile had been raised to the vertical position, the derrick hitch was removed and the crane moved the pile over the top template while men guided it into position. Centered by both templates, the pile was lowered by the crane until it had settled under its own weight into the bed of the lake. Usually all three piles of a bent settled to about the same depth before driving was started.

Held securely in position by the mud and both templates, each pile was driven without leads by a hammer held by the locomotive crane and operated by steam from the crane's boiler. When one of the piles had been driven half way down, driving was stopped and each of the other two were driven, in turn, to the same depth. A second round of driving usually developed full penetration and safe bearing, with the tops of the piles about level with the top of the trestle deck.

Piles Cut Off With Dynamite

After the six piles of a "twin" bent had been driven they were cut off for capping, dynamite being employed to speed operations. By using dynamite a second purpose was accomplished in exposing the reinforcing rods, which were subsequently used as tie rods or dowels to bind the piles and concrete cap together as a sturdy unit.

In the blasting operations a series of holes were drilled around each pile at the same elevation, and a single hole was either drilled from the top down through the axis of the pile, or angled from one side of the pile toward the center. A small charge of dynamite was then placed in this latter hole and detonated, which shattered the pile for about two feet above the series of horizontal holes drilled around it, leaving the reinforcing exposed. These rods were cut with an oxyacetylene torch near the top of the exposed area and the pile butt was lifted off by the crane. When all piles had been cut off and the exposed reinforcing rods had been bent over at various angles

Piles being picked up from falsework preparatory to driving

All the piles were driven vertically. These are half-day down

in a mushroom-like manner, thick reinforced concrete caps were poured in place on top of each twin bent.

Slabs Moved Into Place

After the caps had cured at all three double bents for each firestop, the four precast deck slabs were unloaded on the falsework originally used for the piles. Preparatory to lifting the slabs into place, several pieces of softwood were laid on each cap and a special adhesive mortar was smoothed level with the tops of the strips. After this was done, the track was jacked up, the old timber bridge deck and supporting stringers were cut out, and each of the new slabs was moved into place by the crane and derrick. The weight of each of the slabs compressed the wood and adhesive mortar to a uniform bearing and tight seal.

When all four slabs had been placed, the built-in hooks by which they were lifted were burned off, and the track was blocked up on wooden stringers to await the dragging of ballast to complete the firebreak. The second firebreak was constructed in the same manner and work is now under way replacing, in kind, with treated material, the timber trestle within the 1500-ft. section of trestle programmed for renewal this year.

Moving one of the deck slabs into place. When all were in position, lifting hooks were burned off and the track supported on wood stringers until ballast was placed

One of the Pennsylvania's big ballast cleaners, which will clean from 1400 to 1600 lin. ft. of intertrack space per hour

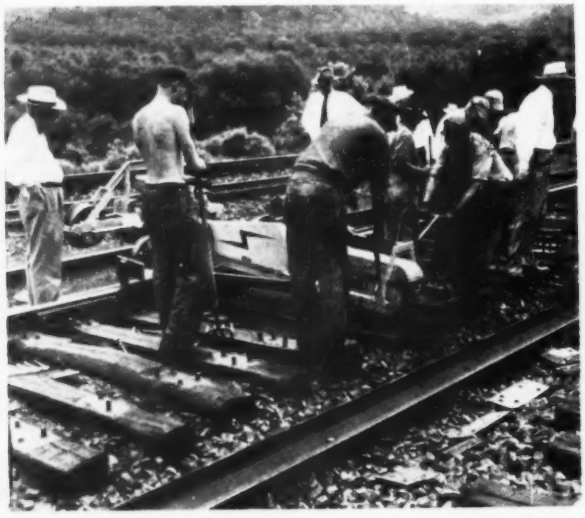
A.R.E.A. Committee Pennsylvania

Travels by chartered buses and special train from New Brunswick, N. J., to Pittsburgh to observe mechanical roadway maintenance

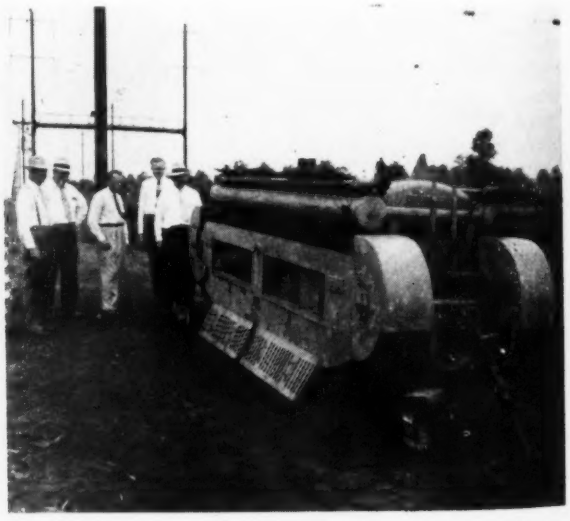
One of the first stops of the committee was to observe deep-ditch cleaning on the New York division with one of the road's newer, highly flexible grading machines

• On July 12-13, as guest of the Pennsylvania, the Committee on Economics of Railway Labor, American Railway Engineering Association, pursuing its study of the economics of mechanized roadway and track maintenance methods, was given an opportunity to observe the methods employed on the Pennsylvania, via bus and right-of-way, New Brunswick, N. J., to Philadelphia, Pa., via special train Philadelphia to Pittsburgh, a total distance of approximately 400 mi. A feature of the "special" was one of the inspection cars of the Pennsylvania, with its open observation end.

Headed by H. E. Kirby, chairman of the committee, and escorted by a Pennsylvania delegation including J. L. Gressitt, chief engi-



A new machine observed with a rail-laying crew, lowering ballast in the tie cribs—on a level plane—ahead of the adzers



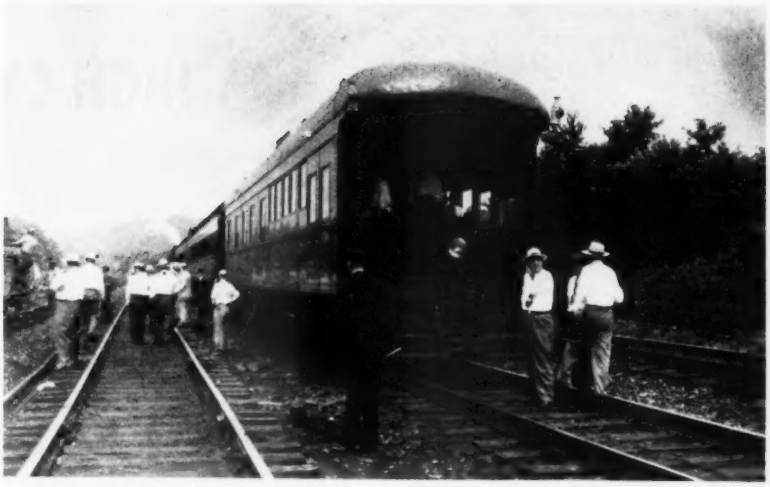
One of a number of 315-cu. ft. capacity crawler-mounted compressors used on the Pennsylvania with 24-tool tamping gangs

Studies Practices

neer, and S. R. Hursh, assistant chief engineer—maintenance, the party of 50 or more made numerous stops enroute to observe, among other things, deep-ditching and ditch-cleaning operations; 24-tool pneumatic tie tamping; track raising and surfacing with power jack and power ballaster; two methods of ballast cleaning; mechanized rail laying; and the road's large Diesel-powered track sweeper. Slow-downs were made to see a number of other operations, including right-of-way grading; follow-up tamping with small, tractor-mounted compressors; bank widening and line-change work, etc.

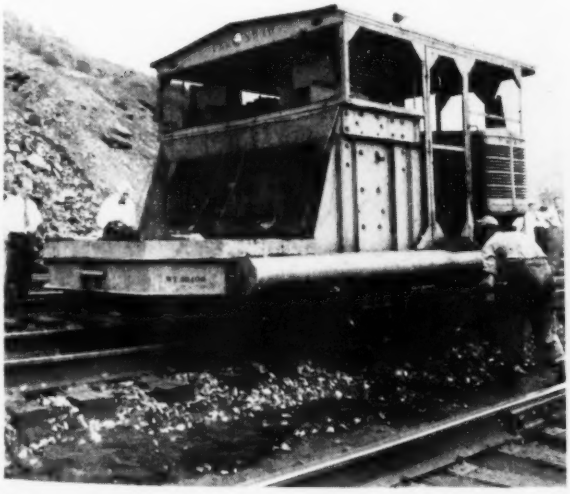
In the observations made, the ground work was laid for subsequent detailed analyses of methods and gang organizations, and of production records and costs. These studies will be conducted by a subcommittee, of which C. W. Reeve, division engineer, Delaware & Hudson, is chairman.

Some of the operations and equipment observed are shown in the accompanying illustrations. A somewhat detailed, eye-witness account of the inspection trip, with other pictures, appears in the *Railway Age* of July 30.

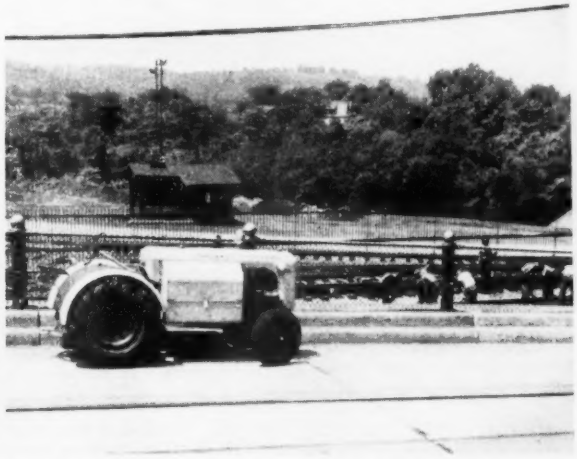


The open-end inspection car, which has an observation platform with 42 seats, afforded an unobstructed view of track all the way from Philadelphia to Pittsburgh

During the 1948 working season, working two eight-hour tricks a day, this Diesel-powered sweeper cleaned 745 mi. of track and loaded 750 hopper cars with debris

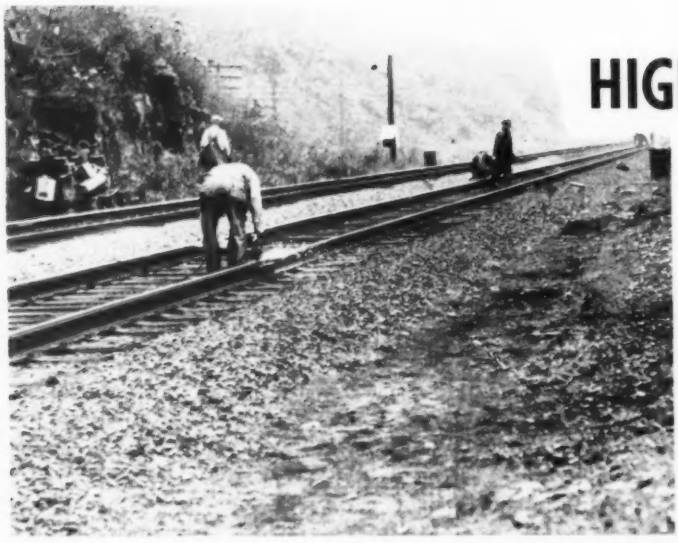


Large-scale track-raising and surfacing operations were observed on the Central region, employing this power tamping machine



One of a number of tractor-mounted, 105-cu. ft. capacity compressors used for spot, intermediate and follow-up tamping

HIGH-CYCLE TOOLS Prove Effective in



General view of the rail-end welding operation. At the left may be seen the tractor which transports the tanks of oxygen and acetylene, and also mounts a belt-driven generator for powering the electric grinding tools

Grinding rail ends, to remove scale and cracks before welding, with a universal electric grinder

By SUPERVISOR OF WORK EQUIPMENT

• For some time our railroad has carried out a program of building up rail ends by welding, following a standard procedure in which we first grind off all scale and cracks at the rail ends, after which the battered ends are built up by oxyacetylene welding, the joints are slotted, and the surface of the welded area is ground until level with the rest of the rail. This technique has proved successful over a period of years in extending the life of the rail and in reducing batter from the impact of rolling stock.

For some time we made extensive use of universal electric tools for performing the various grinding operations included in this work. Three reasons influenced our selection of these tools—low initial cost, light weight, and reduced maintenance. We found that the cost of the necessary universal electric tools, including a gasoline-driven generator, was about $1,300. We found also that the electric tools were light and easy to handle, which meant that the crew became less tired, accomplished more work, and could clear for trains more quickly and with less effort. Also, the gasoline-driven generator could be picked up and carried by two men as the crew moved down the track. Finally, we found that one such generator was able to furnish sufficient electric current for all three grinding tools, making it necessary to service and repair only one engine.

More recently, in experimenting with the surface-grinding of corrugated rail, we used several high-cycle electric grinders. These proved to have excellent operating characteristics and we later decided to test them on a rail-end welding job. At the same time we designed a new rail carriage and mounted the high-cycle electric grinder on it.

This machine consists of a high-cycle electric motor and grinding wheel mounted on a tubular steel frame which rides the track rail on two roliers. The grinding wheel is fed by a screw which is controlled by a handle at the top of the machine. The screw control permits close adjustment of the grinding level, resulting in an exceptionally smooth rail surface.

Welding Work Facilitated

The new carriage and the high-cycle grinder mounted thereon proved highly satisfactory in the welding work. The complete unit weighs only 95 lb. and can be operated by one man. Because of its light weight, the operator can easily move it off the track or handle it from rail to rail. The operator stands erect while the grinder is operating, reducing fatigue and eliminating the possibility of his inhaling abrasive dust from the wheel.

The high-cycle electric grinder has been found to maintain a constant speed under the heaviest loads, resulting in a smooth finished surface, longer wheel life and greatly increased production. The cost of maintaining these tools has been gratifying. One of these units has been in operation for more than four months without requiring any maintenance.

The total savings realized from the use of the high-cycle grinder are very substantial. It has more than doubled the number of rail ends which can be finished in a day and it has made it possible to employ one man less in the welding and grinding gang. These two factors have cut the cost of rail-end welding back to the 1941 level, in spite of present higher labor costs. We are now contemplating the elimination of another man from each such gang, which will further reduce the cost.

The gasoline-driven generator used as a power source has a dual output. It generates 220-volt, 180-cycle, 3-phase alternating current to

in Maintenance Work

In this article, the supervisor of work equipment of an eastern road tells of the effective use being made of high-cycle electric tools in rail-grinding operations on his road in connection with the building up of rail ends by welding. Pointing out several advantages of such tools, he goes on to say that their use is now being extended to other phases of track maintenance.

After welding the rail ends are slotted with the grinder by the same man who does the pre-grinding

Surface grinding the weld with the high-cycle grinder. The dual-output generator, which drives both universal and high-cycle tools, is at left

power high-cycle tools, and also generates 110-volt direct current to operate universal electric tools or floodlights. Thus, while we have not yet converted the pre-grinding and slotting operations to high-cycle tools, we are able to operate both types of tools with the one generator. The generator is rated at 2500 watts, and weighs 129 lb., including the engine, and can be carried easily by two men. It runs for almost two hours on a gallon of fuel, and is capable of operating all three electric grinders at one time. Thus, there is only one power unit for all of the tools in the gang.

Use of Small Tractor

Since we use oxyacetylene welding in building up rail ends, off-track equipment is needed to carry the oxygen and acetylene tanks. For this purpose we attach special carrying racks to a small tractor and also mounted a belt-driven direct-current generator on the tractor as an alternate power source for the universal electric grinders. Eventually, we plan to replace this generator with a belt-driven high-cycle generator. This generator is to be of the same manufacture as the portable unit and will have the same dual-voltage output, making it useful for all types of electric tools and for floodlighting. When this change is made, we will have two sources of electric power with our welding crews, giving us maximum flexibility of operation in carrying out our rail-end welding programs.

In Other Work

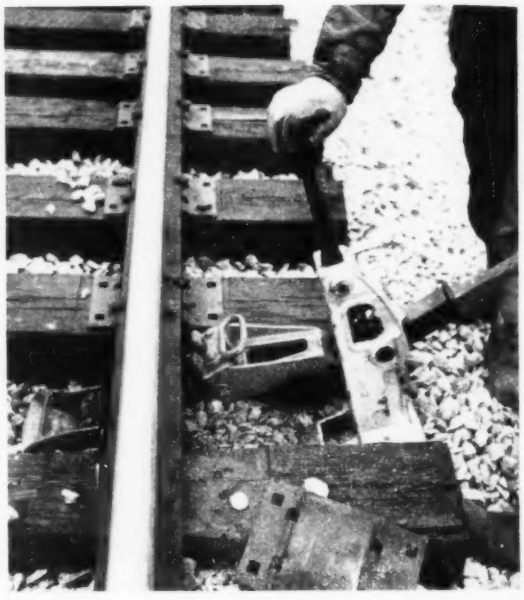
Based on our satisfactory experience with the high-cycle grinder, we plan to convert to high-cycle electric tools for all rail-end grinding operations. We also plan to use high-cycle tools for many other track-maintenance operations and for bridge and building work in combination with dual-purpose high-cycle generators. Our men can use the 110-volt d.c. output for their present universal tools, but have available the 230-volt high-cycle output as they

(*Continued on page 768*)

The generator can be transported easily on a dolly or can be carried by two men

How to Reduce

By JOHN L. McMILLAN
Track Supervisor,
Gulf, Mobile & Ohio
Springfield, Ill.



Above—By actual test it was found that four men with track shifters could line the same amount of track much faster than a 24-man bar-lining gang. Right—Close-up view of a track shifter in position under the rail, engaged by a Simplex A 17 aluminum track jack

• It is not enough to know how to line tangent track and curves by strong-arm methods. There is also the greater problem of getting the work done quickly and economically. Where tracks are allowed to remain out of line, this is usually because there is not enough man-power to do the necessary lining, or because the force available does not have the proper tools to carry it out. And it is more than likely that much track will remain in poor line unless the track forces are properly tooled for the job of correcting it.

One of the effective tools for lining track is the Track Shifter, which is designed to permit the track forces to make use of the full power of their track jacks for this purpose. The result is to put most of the burden of lining track on the jacks, rather than on the men.

Device Proved Successful

Success with these devices has been fully demonstrated during the last three years on a district having 24 sections, each of which is equipped with a set (pair) of track shifters. Besides the ordinary maintenance lining that has been done with these tools, more than 60 curves, some involving street or road crossings, and a number of turnouts and railroad crossings, have been relined with them. The track is of 112-lb. steel and the ballast of many kinds, including large gravel, fine gravel, large stone, small stone, cinders and slag. It has been found that the manner in which the track shifters are used affects the results more than the types of ballast worked in, except that the efficiency of the tools increases sharply in foul ballast.

Shifter Described

The track shifter consists essentially of two specially-shaped castings (one a forward foot casting and the other a lifting casting) separated by two round parallel shafts, each incorporating a movable bushing. Each of the bushings is grooved to provide a seat for the edge of the base of rail and is normally held up against the casting at the lifting end by means of a coiled spring surrounding the slide shaft.

As used, the shifter is placed under the rail, within a tie crib, some of the ballast being dug out as necessary to permit this. In position, the forward, or foot, casting is extended under the rail in the direction of throw, and is partially imbedded in the ballast. The other, or lifting, casting, is engaged by a track jack, which is tilted well forward. As this end of the shifter is raised by the jack the shafts of the shifter are brought to an inclined position, with the result that the bushings move laterally downward under the shifting weight of the track. When the track has been moved as far as desired, or when the limit of the throw with one setting of the shifter (about 6 in.) has been made, the jack is tripped and the track is dropped with a solid impact, which tends to restore it to its original grade.

For normal track lining, two shifters are used in conjunction with one another. These are placed in adjacent cribs under opposite rails, both facing in the direction of throw, the forward jack inside its rail, and the one behind outside its rail. Worked in conjunction with each other, they produce their maximum force in throwing the track.

Many spots in track get out of line between one surfacing and the next, and it is up to the section gang to get after these places or they will reach a condition that will cause cars in fast trains to jar and lurch. Most of these spots are located at points

Track Lining Costs

Based upon the use of Track Shifters under a wide variety of conditions, the author of this article tells how these devices, in company with ordinary track jacks, can be used to advantage in lining tangent track, curves, track through highway crossings, turnouts, rail crossings and other special track work. Each set-up is described and explained, indicating marked advantages over bar lining.

of poor drainage, usually accompanied by foul ballast. Such track can be very hard to line, and when ineffective means are used much time can be spent with poor results. Track shifters are a natural for lining these spots.

For ordinary maintenance lining operations, each section gang should have a set of two track shifters, just as it has its own jacks. Where big lining jobs are involved, especially on curves, more than one gang and more than one pair of track shifters will speed up the work measurably.

Procedure

The procedure with track shifters is simple. First, mark on the rail, the location where you want to apply the power to move the track into line. Next, prepare the opening under each rail of the track, one tie space apart, that the track shifters will slip into snugly, with the bushings against the edge of the rail base. One tie space apart is recommended so that the jack levers will not interfere with each other. Then, while the men placing the shifters hold them up against the base of the rail, the jackmen slip a jack under each one, facing the direction of throw. The men holding the track shifters then assist the jackmen in operating the jacks. As the jacks are operated, the track starts to move over and continues during the time the jacks are worked, to the limit of throw.

The first consideration in the use of track shifters is to get the openings under the rails correct. The way to do this is to have a man with a fork or a shovel, and a pick if necessary, make the first opening by trial. For most lining the smallest opening the tool will fit into is desirable, and the material under the track shifters should be firm and not chopped up with a pick or other tools. The reason for this is that the amount of throw possible with one setting of the shifters depends on how firmly the tool holds—that is, whether the tool holds or sinks under the tremendous jacking pressure applied. The most common mistake made by men starting to use track shifters is to dig the holes ahead of the lining that are far too large. The proper procedure, at least until experience is gained, is to keep the men making the openings close to the men setting up the tools, until all concerned know what kind of opening is best.

Next, make sure the lifting toes of the jacks are under the track shifters and jacks are tilted well forward. An aid to tilting the jack is stomping the ballast behind its base while it is held forward on the toe of the base. If the jack is held down, well forward, at the start, usually the first strokes of the lever will settle it in the most advantageous way. Then both jacks should be operated together and tripped together, with one exception. In precision, or finish, lining, drop the back

Above—Preparing to line curve through an asphalt-paved road crossing. The only preliminary preparation necessary was to dig a trench across the road in the direction of throw

Right—Using four track shifters and four aluminum jacks, eight men easily cracked the pavement and moved the track to line. Filling the crack and the trench completed the job

Above—Showing how the track shifters and jacks are arranged in lining a crossover. Where the rail spread offers enough room, a third shifter is used in center of the track. Below—When the frog is reached the shifters are often used as shown here

jack first and then the front jack. If using an instrument you can drop the track dead on the cross hair in this way with very little experience. It has been noticed that jackmen operating track shifters prefer jack bars somewhat shorter than ordinary bars.

New users of track shifters may be inclined to dig out in front of the tie ends in the direction of line, but they will soon find that, with the shifters, they will have enough power to push the ballast ahead in most cases, without the laborious and expensive digging.

The lift required to line track with track shifters varies as much with the way the shifters are set up as with the condition of the ballast. By actual test it was found that 24 men with bars lifted track more to throw it 5 in. than 4 men did with a pair of track shifters. It was also noted the four men with track shifters lined the same amount of track much faster, working over a stretch where the ends of the ties were not dug out, than a 24-man bar-lining gang, where the ties had been dug out on the ends.

It has been found that on long lining jobs two or more sets of track shifters speed the work measurably. Take a stretch of track ten rails in length, for example, where you plan to throw at each center and joint. You start on the center of the first rail and end on the far joint of the tenth rail. With one set of track shifters you must set up 20 times to move the ten rails into line. With two sets you set up only ten times, and with four sets only five times to line the ten rails. If it takes two minutes to make a set-up, throw, and move ahead, and you are using four men to a set of track shifters, it will take four men 40 min. to line the ten rails, eight men 20 min., and 16 men 10 min. It has been found that extra sets of shifters increase the possible throw (by relieving tension ahead) as well as the speed of lining.

One thing is certain in curve lining—the easier the rail can expand and contract the more satisfactory the lining. If you have loosened all joints possible and the track lifts instead of moves over, the work should be stopped until the tight rail has been released. If this happens when the track is being thrown out, it may be necessary to take the bolts out of the end of one rail on both sides and let the track pull apart, adjusting the expansion later. If the trouble occurs while lining the track in, a piece of rail may have to be cut out of the track on each side.

There is a great field for these tools in lining tangent track free of swings and curves free of small compounds prior to surfacing. The time saved by not having to strip the track or to dig out in front of the tie ends can all be applied to surfacing the track. After the track has been surfaced, all it will require is a light touch up line and it will be secure on its new bed.

The best procedure for heavy continuous lining is to have a small gang of men follow up with bars and do the touching up. Easy as this bar lining will be following the track shifters, which have broken the track loose in making the major throws, the track shifter gang will leave the bar gang far behind.

It is always best to do heavy lining under slow order. After the first train has gone over the track, go back over the line, check the level, and touch up any spots necessary. Having done this, it will be found, in most cases, the slow order can be lifted. Sometimes, however, it may be desirable to maintain the slow order until the track has been surfaced.

Shifting Turnouts

Shifting turnouts in full ballast section is usually beyond the power of lining-bar gangs, even with the help of various bar-operated liners, and jacks have had to be used—usually small ones of short range. Large jacks can't be set up firmly in the shoulder ballast to push against the track, and, space will not permit their use along the lead rails. The only place they can be used is at or near the frog. When used against the frog, face down, cap against the base of rail, and with block behind the base of jack, they are effective.

but have certain draw-backs. The power thrust can push the track over, or up, or may push the base of jack back into the ballast. Usually the jacks must be reset many times and frequently cock the track on the side in the direction of line.

Jacks, in combination with track shifters, can be used throughout turnouts and greatly increase the power thrust. In shifting turnouts, track shifters are used in pairs until the spread offers room for a third track shifter in the center of track. Then they should be used, three and three, in a staggered line across the track. Often fine results are achieved by bringing all three into the center of the track and lining them up along the frog when it is reached.

Starting at the point of switch, set-ups every 15 ft. are satisfactory. If the throw does not require the moving of the connecting track, turnouts can be lined in about twice the time that is required to line an equivalent amount of single track. If the connecting track has to be moved, the time required may be doubled. By employing comparable methods and an adequate number of track shifters, double slip switches, movable-point crossings and crossovers can also be shifted as desired.

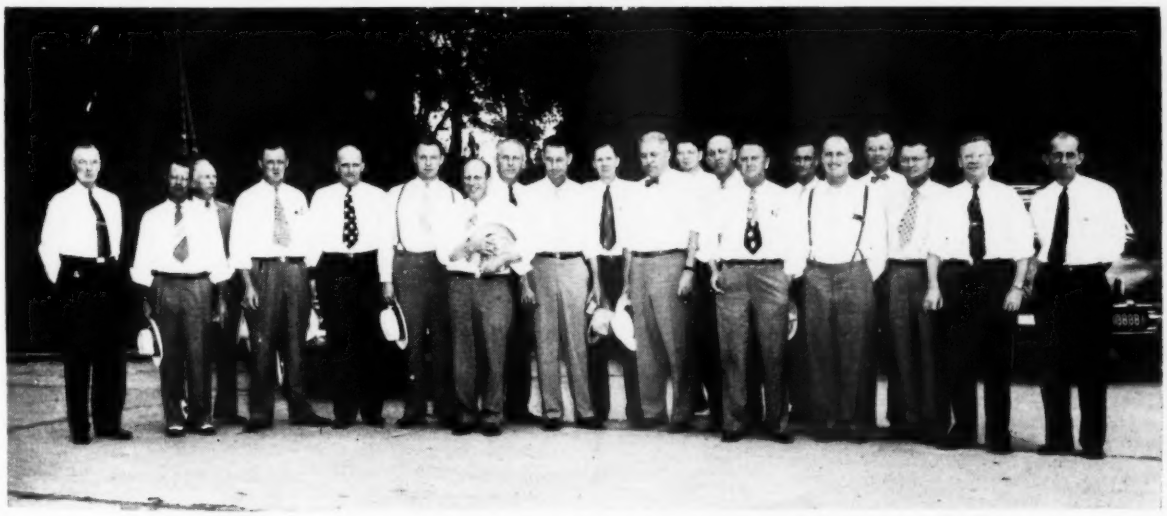
When shifting a heavy track structure on loose ballast, fewer track shifters are necessary if a plate is put under the footing of each shifter. An effective plate can be made of pipe. To make such a plate, first cut five nine-inch lengths of one-inch gas pipe and split them lengthwise into two halves with a slot grinder. Then weld these pieces together, side by side, alternately hollow side up and hollow side down, and reinforce each side underneath with a 1-in. square steel bar 10 in. long. The result is a corrugated plate nine inches wide and more than ten inches long, with alternate lateral parallel ridges and grooves. To complete the plate for ready handling, weld on one end a one-half inch rod, shaped like a flat iron handle. Such a plate, placed with the reinforced face down, forms a firm, secure footing in the ballast for the shifter shoe.

Often when lining curves, road or street crossings encountered stop or delay the work. With track shifters these can be taken in stride without the necessity of tearing up the crossings and replacing them. Advance men, however, should dig a trench across the road or street along the ends of the ties in the direction of line. This trench should extend down to the bottoms of the ties and be at least as wide as the throw to be made. Two pairs of track shifters should then be set up as close to the crossing as possible, one pair at each end.

In shifting track through long crossings where the correct throw at each end leaves the center still out of line, it is often possible to overthrow the ends to bring the center in line, and then to throw the ends back. Another way is to place a small jack against the track in the center of crossing, either set so as to push against the boards, or so that it will push against a tie end.

Shifting railroad crossings is best performed by using four rail expanders and four track shifters. This method requires planning, but with it you can put a crossing right in line and not get a slip-shod job as is often the case when using a large number of men and rail for driving. The idea is to have two rail expanders pulling the crossing on one side, two rail expanders pushing the crossing on the other side, and two track shifters set up on each side of the crossing to keep the cross track moving. The pushing expanders are used, one on each rail, as nearly opposite from each other as possible. The pulling expanders are set up the same way on the opposite side of the crossing. It is often the best to saw out a piece of each rail (on the side in the direction of line) as many inches long as the crossing has to be moved. The track must be allowed to pull apart this amount on the opposite side, and then when the gap on the cut side is closed, longer rails should be placed on the open side. The track should then be well anchored in all directions.

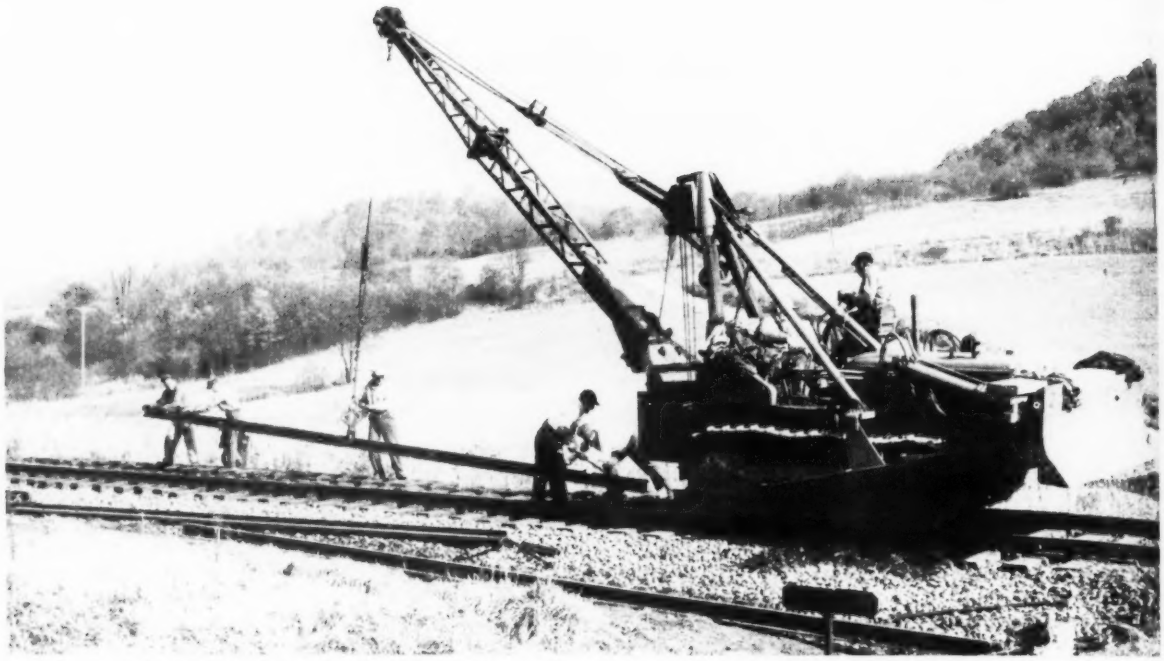
The track shifters described in this article are manufactured by Templeton, Kenly & Co., Chicago.



Work Equipment Committee Inspects Supply Company Plants

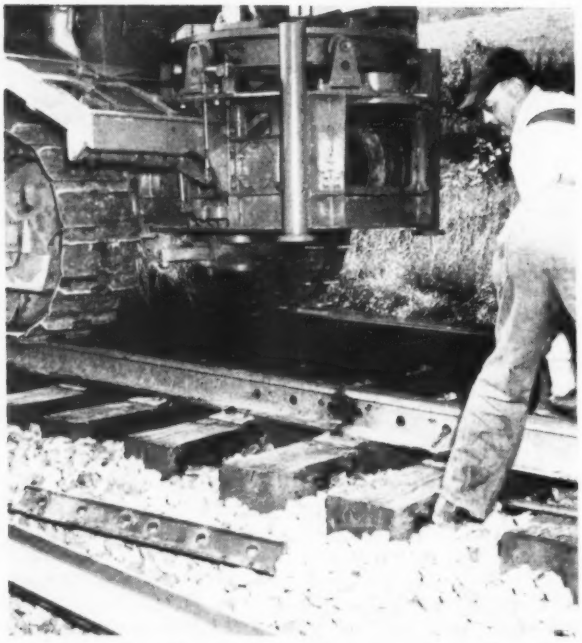
A.R.E.A. Committee 27, Maintenance of Way Work Equipment, held its June meeting in Milwaukee, Wis. and visited the Koehring Company and the Nordberg Manufacturing Company plants.

Members and guests photographed at the entrance of the Nordberg plant are, left to right: C. L. Ferro (B.&M.), F. E. Yockey (M.P.), C. H. Paris, guest (C.&I.M. retired), L. F. Conner (S.A.L.), V. W. Oswalt (Sou.), J. W. Risk (C.N.), W. F. Kohl (Sou.), E. L. Cloutier, (N.Y.C.), W. I. Stadter (M.P.), H. E. Michael (R.E.&M.), J. M. Giles (M.P.), W. S. Brown (B.&O.), F. H. McKenney (C.B.&Q.), R. K. Johnson, chairman, (C.&O.), S. E. Tracy (C.B.&Q.), C. E. Morgan (C.M.St.P.&P.), J. D. Whitaker (Nordberg), W. E. Kropp (L.V.), Harry Mayer (C.& N.W.), and N. W. Hutchison (C.&O.).



Rail laying is one of a great variety of tasks for which the crane-equipped Caterpillar tractors are used

Erie Finds Many Uses For Tractor-Crane Units



Close-up view of one of the tractors engaged in laying rail

• Five Caterpillar D-6 crawler tractors equipped with Hystaway attachments are kept busy at a variety of jobs on the Erie, and it is reported that new types of work are being continually found for them. Rail laying is one of the many jobs for which these units are being used with highly satisfactory results. In laying rail they are run either on the subgrade or on the rails.

Each of the Hystaway units is equipped with a ½-yd. clamshell bucket and also with a dragline having a bucket with the same capacity. Using this equipment considerable ditching work is being done with the combination units. In this work the cuts are first widened with the bulldozer with which each tractor is equipped, after which the dragline attachment is used to form the ditch.

The machines have been used for grading for driveways, new tracks, etc., using both the bulldozer blade and the dragline and crane buckets. Also, the machines are used for handling materials to and from railroad cars, using the buckets or tongs attached to the boom line, operating both on the cars and on the ground. On a recent job, involving the removal of stone masonry from a pier and its replacement with concrete masonry, the road, using one of the tractor-Hystaway units, effected a saving of $700 as compared with its own estimate of the cost. In this work the stones from the old pier were removed with lines from the Hystaway boom, and were placed along the banks of the stream as riprap, using the bulldozer blade.

In another instance one of the machines was used for salvaging a mile-long section of 6-in. water main. The dragline was used for excavating and uncovering the pipe, the pipe was lifted out of the trench by the boom, and the trench was backfilled by dozing the material into place. The tractor-crane units have also been used to advantage in excavating for both water and sewer lines.

Below—Herder and two of his three collies, bred and trained for service as sheep dogs. Left—At a word from the herder, the dogs round up the herd and move it to another section of the yard

Sheep and Goats Work for the Santa Fe

By J. S. GIDDINGS
Superintendent
Santa Fe Tie & Lumber Preserving Co.
Somerville, Tex.

Fire is a constant threat to timber-storage areas, especially those near wood-preserving plants. For this reason many methods of controlling weed growth in such areas have been tried with varying success. These have ranged from manual eradication to power mowing and chemical spraying. This article describes an unusual way by which the Santa Fe Tie & Lumber Preserving Co., a subsidiary of the Atchison, Topeka & Santa Fe, has minimized grass-fire hazards at its storage yards at Somerville, Texas.

• By pasturing goats and sheep on its 310-acre timber-seasoning and storage yards at Somerville, Tex., the Atchison, Topeka & Santa Fe has effectively and economically controlled weed growth and reduced the danger of fire. Several chemicals are also under test at Somerville for weed and grass control at the treating plant, and if and when such chemicals prove more effective and economical than the herd, they will be used.

The climate at Somerville, including a high average annual rainfall of nearly 40 in., creates ideal conditions for the rapid growth of grass and weeds which, if not properly controlled, would result in a serious fire hazard. At the time of the construction of the plant in 1905, the so-called bitterweed and the hardy Bermuda grass were predominant among the several kinds of grasses and weeds that were prevalent in that area. At that time the grasses and weeds were controlled by an expensive method in which men cut the Bermuda grass with hoes and other special tools made for the purpose and then raked it up and hauled it out of the yards for burning. School boys were hired during their summer vacations to pull the bitterweed, The latter was effective in that, after several summers of pulling, the bitterweed was no longer an important factor. The weed pulling and the grass cutting program was aided to a large extent by the grazing of cows and other animals on the plant yards. After enactment of a stock law by the City of Somerville, however, some 25 years ago, it was necessary to resort to more cutting, which resulted in additional expense.

In the summer of 1927 the management decided to purchase goats to graze the plant yards. One hundred goats were purchased in June of that year, and about 200 more during the next two years. Some years later the use of sheep was suggested, and at the present time approximately 100 sheep and 200 goats graze the plant yards.

Although the grazing habits of these animals vary according to the condition of the vegetation and the amount of supplementary feeding, the sheep cut the vegetation very close to the ground, while the goats usually crop the tops of the tender young weeds to a height of an inch or more above the ground. This prevents seeding later in the year, and thus proves doubly effective in controlling weed growth.

During the periods of little or no growth of vegetation, the animals are fed oats and prairie hay in amounts sufficient to keep them in good physical condition. Feeding is discontinued during the spring and summer when there is plenty of green grass and weeds. Watering

At night the animals are returned to corrals provided with sheds, watering troughs and, in winter, with feed. One of the feeding troughs in shown in the foreground

troughs are placed throughout the yards so that plenty of drinking water is available at all times. Breeding is controlled so that the young animals will arrive in March and April when the weather is usually mild.

Initially, the death rate among the goats and sheep was high, but it has been reduced to the minimum by methods of care and control, which have been improved by experience with these animals and by advice from the Department of Animal Husbandry, Agricultural and Mechanical College of Texas. Intestinal worms are controlled by the use of a phenothiazine drench twice a year, while external parasites, such as lice and ticks, are removed by an animal dip in a solution containing a small percentage of lye and 9 lb. of Black Leaf-40 in 600 gal. of water.

Sheep Dogs Aid Herder

The goats and sheep do not require a great deal of care. They are kept at night in corrals which are provided with feed, water troughs and sheds. Only one herder and one laborer, aided by three well-trained sheep dogs, are required to care for the 300 animals.

The dogs are Border collies, an imported type, bred for service as sheep dogs, and are remarkably intelligent and efficient. When the herder decides to move the goats and sheep he has only to speak to the dogs and they know exactly what to do. If some of the animals stray from the rest of the flock or get on the yard tracks in the path of a plant switch engine or locomotive crane, the dogs can round them up in a few seconds and move them to a place of safety. When the flock is returned to the corral in late afternoon, the dogs search under and around the many stacks of ties and other material for strays and, if any are found, return them to the flock.

High-Cycle Tools Prove Effective

(Continued from page 761)

change over to high-cycle electric tools.

We have equipped one bridge gang with a one-man high-cycle electric chain saw for cutting piles and heavy timbers. We now contemplate the purchase of high-cycle impact wrenches for running lag screws, bolting timbers, and the temporary bolting of steel structures before welding or riveting operations. These impact wrenches are relatively small and are correspondingly light in weight. One man can use such a wrench in almost any position without the danger of being thrown off a scaffolding, because the torque against the operator is negligible. This safety feature, we feel, is of great importance.

The list of high-cycle electric tools, in addition to those mentioned, includes drills, paving breakers, concrete vibrators, and circular saws. The low maintenance cost and ease of operation of these tools, together with their excellent operating characteristics, open new fields for mechanizing railroad repair and maintenance work.

British "Frog" Rammer Compacts Soil

SHOWN here is a British development, called a frog rammer, for compacting soils. When in operation the device, driven by gasoline and weighing one ton, moves over the ground in short frog-like leaps (hence the name "frog" rammer). It is also available in a ½-ton model. The British Railways recently ordered six of the latter model for strengthening weak formations (such as unstable clay soils) under and alongside ballasted track.

The Great Northern's passenger station at Kerkhoven, Minn., after remodeling. It is painted white and has green asphalt shingles

Undercuts Old Stations to Get Modern Lines

The station at Kerkhoven, built in 1890, looked like this before it was remodeled

• Using an unusual method, the Great Northern has converted four small frame passenger stations—at Hatton and Cando, N.D., and at Robbinsdale and Kerkhoven, Minn. —into highly attractive and modern structures at a cost of about $20,000 each, or about 20 per cent less than the cost of comparable new structures.

Of particular interest in this work is the nature of the preliminary alterations made to the basic structural frame of each of the old buildings, namely, sawing a portion off the bottom to lower the entire structure, and cutting off most of the long eave overhang all around. The former operation not only made a fundamental improvement in the appearance of the stations, without major roof alterations, but also lowered the ceilings and reduced substantially the wall areas, both interior and exterior, to be covered with new material. The latter operation reduced the amount of new roofing required and, at the same time, further improved the lines of the buildings.

The old stations, built about 1890, were of a design characteristic of the period, having wood-shingled gabled roofs which overhung the ends and sides of the buildings by 3 ft., exterior walls covered with drop siding, interior walls and ceilings

"Before" and "after" views of Robbinsdale station. Except for a portion of the bottom the frame of the old structure was reused

sheathed with V-jointed and beaded material, and timber foundations. In size they averaged about 24 ft. by 80 ft. They were all painted gray. The platforms serving the stations were of timber construction. The remodeling was dictated primarily by deterioration of the foundations and high maintenance costs in general.

In the first step of the remodeling work each of the old stations was jacked up and supported on blocking while new concrete foundations were constructed, including a new footing for the chimney. Then, from 2 ft. to 4 ft. were cut off the bottom of the studding all around to provide a 10-ft. ceiling height, and the frames were jacked down onto their new foundations. Next the eaves were cut back to provide an overhang of only 8 in., and the old siding and roofing were stripped off.

After completion of the alterations to the frame, new concrete floors, horizontal-type windows, doors, partitions, ticket counter and modern toilet facilities were installed. The floors were topped with patterned asphalt tile, interior walls sheathed with Nu-Wood plank above plywood wainscots and the ceilings finished with white Nu-Wood tile. The Nu-Wood on the walls was left in a natural color (variegated tan), while the plywood wainscots were given a walnut stain and varnished. In the heated areas of each of the buildings the walls and ceilings were insulated with balsam wool. Oil stoves were installed for heating and fluorescent fixtures for lighting. The old wall-type setees were cut in height and refinished in white lead and green stain.

The exterior walls were covered with 10-in. cedar lap siding and painted white. Screens and storm sash are painted green to match green shingles and signs. The old roof boards, which were spaced with openings between them, were removed and replaced tight, and covered with Lehon "Town and Country" asphalt shingles in a green shade. The eaves were boxed in. The new station signs, very effective in appearance, consist of letters 12 in. high, made of Armco steel covered with green porcelain enamel. New concrete platforms were placed at all the stations and accounted for about $5,000 of the cost of each station.

These stations were remodeled by the bridge and building forces of the Great Northern under the general direction of H. J. Seyton, chief engineer, assisted by J. W. Hayes, architect.

Pre-Designed Trackwork for Pier Extension

UNDER construction in this picture is the largest individual pier track job ever to be undertaken on the Pacific coast. The project involves the installation of 760 tons of pre-designed Bethlehem Steel trackwork on the extension, by the Board of State Harbor Commissioners, of Pier 50 at San Francisco, Cal. When completed the pier addition, with 14 acres of loading facilities and pier sheds, will be able to handle more ship cargoes at one time than any other single pier on the coast.

Talgo Train—and the Track

• Some equipment design features of more than ordinary interest to track men are incorporated in the A.C.F. Talgo—a passenger train representing a radical departure in passenger-car construction, which was recently introduced by the American Car & Foundry Co. This train, which has made demonstration runs in various parts of the country, is now on exhibit at the Railroad Fair at Chicago.

Briefly, the train consists of four articulated passenger-carrying units and one equipment unit, each unit having only one pair of wheels placed at the rear. The front end of each unit is supported by a special coupling arrangement on the back end of the unit ahead. In comparison with streamlined equipment in service on the railroads today, the Talgo coach is almost 4 ft. lower in over-all height and 75 per cent lighter in weight.

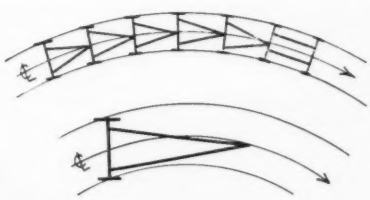
The A.C.F. Talgo train represents a radical departure in passenger-car construction

A feature of the train of particular interest to those concerned with track design is its demonstrated ability to run at appreciably higher speeds on curves than conventional trains. There are two reasons for this: First, the center of gravity of the A.C.F. Talgo is about 2 ft. lower than conventional coaches, and is approximately the same height as the points of suspension. Secondly, frictional resistance is used to prevent the wheels of the Talgo train from climbing the outer rails on curves.

The low center of gravity was achieved by suspending the car on two stub axles connected by a U-shaped nonrotating axle to maintain gage. Thus the floor of the car, only 18 in. above the rail, is actually between the wheels instead of above the wheels.

The anti-derailing friction force that is set up when the Talgo coach travels around a curve is said to be due to the fact that its wheels are guided around the curve much like a two-wheel trailer behind a truck. When a standard railway car is operating on a curve the flange of the outside leading wheel of each truck rubs against the outside rail with a downward motion, causing a reaction that tends to lift the wheel, derailment being prevented, of course, by weight. As a unit of the A.C.F. Talgo goes into a curve, it is turned inwardly very slightly by the preceding unit which is already in the curve. The leading edge of the flange is thus pulled away from the outside rail. On sharper curves and at higher speeds, the trailing edge of the wheel flange rubs upward against the outer rail, causing a force that pulls the unit downward, adding to the safety of the train.

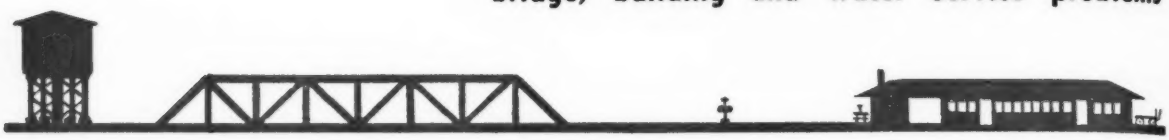
There has been considerable speculation regarding the possible effect that general adoption of Talgo-type trains would have on railroad practices with respect to curve reduction and super-elevation. One line of reasoning is that the need for curve-reduction work would be greatly lessened. Another is that, since the Talgo-type train can take a curve at a considerably higher comfortable speed, super-elevation generally could probably be reduced.



Right — Showing how wheel flanges are pulled away from the high rail by use of the trailer principle. Below —The back end of a coach. Floor is 18 in. above the rails

WHAT'S THE ANSWER?

An open forum for maintenance men on track, bridge, building and water service problems



Reinstalling Plate-Cut Ties

If ties in main line track are badly plate cut, yet otherwise sound, is it advisable to turn them upside down in the same location when surfacing track and making general tie renewals? What are the advantages? The disadvantages? Explain.

Works Fine If Supervised

By Edward Wise, Jr.
Engineer Maintenance of Way, Louisville & Nashville, Louisville, Ky.

Plate-cut, but otherwise sound ties can be turned upside down and reused to considerable advantage close to their original location when surfacing main-line track and making general tie renewals, provided that: (1) Their use is limited to four turned-over ties to the rail length, and to curves of three degrees and under; (2) each turned-over tie is placed between two good ties; and (3) they are not used as joint ties. This practice conserves timber and labor in handling ties. It gives good support for the base of rail, overcoming the ill effects of our unbalanced tie plates that cut into the tie deeper on the gage side than on the field side, and thereby cause an additional cant to the rails, excessive rail wear and gaging. The practice of turning over ties has straightened up the rail and has resulted in smoother riding main track.

There are no disadvantages to this practice as far as this railroad is concerned. We have found that turned-over, plate-cut ties will last from three to six years in high-speed main track.

We have turned ties over, in place, for the past 15 years and have intensified our use of this practice in the past five years, during which time we have turned over about 90,000 ties per year and reused them. This equals about 10 per cent of new ties actually used in track during that period.

In the event that we have more plate-cut ties than we think should be turned over and used in main track, we divert them to branch lines, to side tracks or to yard use. Also, in constructing new mine spurs it has been our practice to use, in order, one new branch-line tie, one secondhand tie (tie released from abandoned track), and one turned-over, plate-cut tie. If all new ties were used on all such construction they would wear out at about the same time and track would have to be re-tied practically out of face. We have found that by turning plate-cut ties over we can make tie renewals in such spur tracks in the regular order of track maintenance, hence permitting section forces to keep this track in safe condition at all times.

A perusal of our "grading report of track inspection" shows that the system average, year by year, have not been affected adversely by the practice of using turned-over, plate-cut ties in main track. The main things to observe in this practice are the limitations set forth at the beginning of this article. In other words, there should not be too many of them and they should be located at the right position in the track. Following these precautions is a mere matter of supervision letting the track forces know just how we want this work handled.

Not the Right Solution

By M. L. Frederick
Roadmaster, Northern Pacific, Spokane, Wash.

Plate-cut ties are caused primarily from the use of undersized tie plates which do not provide sufficient coverage and bearing for the heavy wheel loads carried. Other contributing factors are wide spacing of

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Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, *Railway Engineering and Maintenance*, 79 W. Monroe St., Chicago 3, and reach him at least 30 days in advance of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In the October Issue

1. To what extent would the burning of locomotive headlights during the day minimize the hazard to men working on or about tracks? Does the type of headlight make any difference? Explain.

2. When small stations or other small buildings must be built on soft ground, what types of foundations can be used? What are their relative advantages?

3. When is the best time to spray the right-of-way with chemicals to control weeds and woody plants? What factors are involved? Explain.

4. For what purposes can power chain saws be used effectively in bridge and building work? What savings can be realized through their use?

5. When raising track with a Pullman-Standard Power Ballaster, how should the handling of track jacks be organized? What type of jack is best adapted to this work? How many jacks should be used? Explain.

6. What are the various factors that affect the desirability of using municipal water supplies for heating boilers and for engine cooling on Diesel locomotives? Explain.

7. To what extent are welded fasteners adaptable to the installation of corrugated roofing and siding on railway buildings? For what other building purposes may these fasteners be used? Explain.

ties, excessive superelevation, churning track, poor adjoining ties and lack of other maintenance.

To remove, turn over and re-insert such plate-cut ties is not in my opinion, the right solution. In so doing the underside of the tie is exposed to the elements and deterioration is accelerated, resulting in rapid plate cutting and mechanical destruction. From a labor-cost standpoint, this also amounts to an out-of-face renewal.

A more economical and practical method in my opinion, would be to leave such ties in track as they are, pull the spikes, remove the plates, adze to uniform bearing and insert larger plates. Where the plate cutting exceeds 1½ in. and the tie is otherwise sound, it should be removed and used in secondary or less important tracks. Observation in the field over a period of years discloses little plate cutting even on softwood treated ties when large tie plates are used.

May "Turn Up Their Toes"

By A. A. Miller
Chief Engineer, Maintenance of Way, and Structures, Missouri Pacific, St. Louis, Mo.

I am convinced that if all the ties that are removed from railroad tracks in our country in any given year, because they are, by one's judgment, no longer fit to serve as ties, were split lengthwise and examined, it would be found that at least 80 per cent of their strength and substance still remained. Of course, this means that a fearful loss is incurred, one that maintenance men and management would like to prevent.

Not as a practice, but at different times when the "experimenting mood" was strongly in the picture, we have turned over ties in our main line. Generally, we have found that these ties would become broken-ended in a comparatively short time, calling for the insertion of new ties and resulting in the labor cost for inserting the turned-over tie being greater than the value of the "service life" obtained from it.

With the improvement in the art of preserving and protecting ties, I believe that ties should be bored, as they are now, and in addition, adzed on both the top and bottom so that a proper rail or tie-plate seat would be presented should the judgment of a track foreman indicate that a tie should be turned over to lengthen its service life. I think that such adzing on the bottom of the tie would be an aid in maintaining line, even though the tie were never turned over for the purpose of giving longer tie life.

This question brings to mind some foreign practices which have been tried at different times in our own country. Prior to the war, when new rail was laid in Germany, the entire bed of ties was salvaged and some were sent to light-traffic lines, others to sidings, and others used for fence posts. By that process the Germans salvaged ties in the same way that they undoubtedly salvaged the released rail.

Some six or seven years ago we did this on about seven miles of our railroad on a heavy-traffic line and, as was expected, the process resulted in having a fine railroad. But when it came to salvaging the ties that were released, it cost too much to make disposition of them—in effect, the practice was not economically sound.

I feel that the railroad industry has done a good job in preserving ties, but I think we have a long way to go in protecting them in such a way as to extend the life of ties economically many years beyond what we now get out of them.

Keeping Heat Number Records

To what extent has the use of control-cooled rail affected the need for maintaining records of heat numbers? Explain.

No Longer Necessary

By T. A. Blair
Chief Engineer, Atchison, Topeka & Santa Fe, Chicago

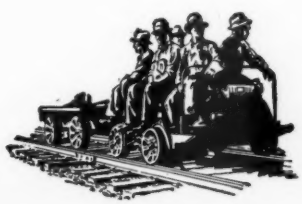
Transverse fissures originate in what has been termed "shatter cracks" or, in other words, small internal separations in the rail head caused by a too-rapid rate of cooling. Investigations have revealed that when shatter cracks are present in any one rail of a heat, the condition is general throughout the heat.

This has been the reason that the practice was adopted of removing from track rails of entire heats that have developed transverse fissures. To facilitate the locating and removing of rails of such heats it was necessary to maintain records of heat numbers.

Reports on control-cooled rail made by the Association of American Railroads to date indicate that this process eliminates the shatter-crack conditions and by so doing eliminates transverse fissures. Therefore, there is no advantage in having a heat-number record. Until further developments, there will be no occasion to remove rails of any particular heat of control-cooled rails.

Rail failure statistics show that some transverse fissures have occurred in control-cooled rail, but they were due to conditions peculiar to each rail and in no sense casts any suspicion on the rest of the rails of the heat.

The practice of recording heat numbers was discontinued on the Santa Fe in 1948, and if in the future it becomes expedient to remove rails of certain heats, the practice can be resumed.



Control Cooling Stops Need

By G. M. Magee
Research Engineer, Engineering Division, Association of American Railroads, Chicago

Early railway experience showed that certain heats seem to be prone to the development of transverse fissures. Accordingly, the practice developed of keeping a record of the number of transverse-fissure failures occurring in individual heats, and of removing the entire heat from track after a certain number of failures had occurred. Because of the difficulty in locating all of the rails of any heat in track, an additional practice was later started of keeping a record of the location of all rails in track with respect to their heat numbers.

Research investigations at the University of Illinois, which were sponsored jointly by the rail manufacturers and the Association of American Railroads, have clearly indicated that transverse fissures develop from shatter cracks which occur during the cooling of the rail. The control-cooling technique was developed in this investigation, and the laboratory results indicated that with this process the cause of transverse fissures would be completely

eliminated. Service experience of over 10,000,000 tons of control-cooled rail in track has corroborated this, because no true transverse fissure, developing from a shatter crack has been found to date in any properly control-cooled rail. Accordingly, there seems to be no further need for maintaining records of heat number locations, and it would appear that the railways might as well save this additional clerical expense.

Disposing of Fluorescent Tubes

Why must care be used in disposing of broken or burned-out fluorescent lamp tubes? What method of disposal should be used? Explain.

Beryllium Injures Lungs

By Louis W. Spolyar, M.D.
Director, Division Industrial Hygiene, Indiana State Board of Health, Indianapolis, Ind.

For a time medical literature was studded with reports of rather serious and dramatic changes in the lungs of some of the workers exposed to dust containing various beryllium compounds. Most of the difficulty occurred in plants manufacturing lamp tubes, such as are used in modern lighting fixtures.

Originally some of the lamp manufacturers used as much as 12 per cent beryllium as a component of their phosphor powders. However, about 1943 the percentage of beryllium was reduced to approximately 2 per cent. According to a report by Dr. Grier*, the beryllium compound used is manganese beryllium silicate.

The chest changes produced as a result of this exposure have been fairly well controlled in the plants manufacturing such lamps. Now, the possible hazards associated with the disposal of these beryllium-containing phosphor tubes brings another problem to the fore. In disposing of old, burned-out tubes, breaking them creates a dust containing beryllium compounds. This dust offers three possible hazards: (1) Inhaling the dust may produce chest changes such as have been observed in the plants manufacturing such lamps. These changes, which last for three weeks or more, include pain in chest, shortness of breath, cyanosis, and fluid in the lungs. (2) The dust containing beryllium might gain entrance into a wound sustained by breaking the tube. If this happens, and if all the beryllium compound is not removed, healing will be delayed and the wound may not heal for months. It appears that the beryllium contaminant in the wound produces a granuloma with very irregular areas of necrosis. (3) Such tubes also contain some free mercury, which is potentially hazardous.

To minimize the inhalation of such dusts, various methods of disposal have been developed by suppliers of beryllium compounds, by insurance companies and by various state boards of health. Several disposal methods have merit, depending on the number of tubes to be disposed.

For users of a small number of lamps, the tubes may be placed in a burlap bag, immersed in water in a trough or shallow tank (being buoyant they will have to be weighted down), and broken with a crowbar or length of pipe. Wet bag and all can then be removed intact and dumped.

The Industrial Hygiene Division of the New York State Department of Labor has tried the folllowing method and recommends it. In an open-end oil drum, two parallel bars are made a part of a removable frame which is placed about one-third of the way from the bottom to the top of the barrel. The barrel is filled about two-thirds full of water. Individual tubes are placed between the bars and snapped off below the water level. A removable wire-mesh basket, slightly smaller than the diameter of the drum, may be made to catch the broken glass.

In the open air, where phosphor dust and any mercury vapor will be quickly dispersed by air currents, fluorescent tubes may be broken individually in their cardboard jackets by a crowbar or length of pipe. The operator should stand to windward and wear goggles and heavy canvas or leather gauntlets. Disposal in an incinerator is inadvisable.

Attention should be drawn to the fact that the tubes are under vacuum and will *implode* when broken, but once in a while one will *explode*. Thus, in any method of breaking, either dry or wet, it is necessary for the operator to wear heavy gauntlets and goggles.

Beware of Broken Tubes

By Leonard Greenburg, M.D.
Executive Director, Division of Industrial Hygiene and Safety Standards, State of New York, New York

The increased use of beryllium in industry has brought to light several new pathological reactions among workers handling it. Beryllium is a light metal chemically related to calcium. Until 1931, it existed largely as a laboratory curiosity, and as an ingredient in gas mantles. Since then, however, many new uses for it have been found. Calcined with zinc oxide and silica, it makes an excellent "phosphor" for luminescent lamps, neon signs and cathode-ray tubes.

It's a "slick trick" to dispose of burned-out fluorescent tubes in this unit, according to E. T. Cross, vice president of Armco Drainage & Metal Products, Inc., Middletown, Ohio. Tubes are dropped into the chimney at the right of the barrel-like container and are ground safely to bits beneath the water inside.

*Grier, Robert S.; Nash, Peter, and Feriman, David G.: Skin Lesions in Persons Exposed to Beryllium Compounds, Indus. Hyg. & Tox. 30: 228-237, July, 1948.

Toxic responses to berryllium occur primarily in the lungs, upper respiratory tract and skin. These responses occur primarily: (1) Among workers exposed to the soluble salts in the beryllium industry; (2) among workers handling beryllium phosphors in the manufacture of neon signs and fluorescent lamp tubes; and (3) among person inhaling dusts or being cut by glass from broken neon or fluorescent tubes.

This latter hazard is created largely during the disposal of burned out tubes. When broken these lamps burst with considerable violence, emitting a puff of phosphor powder. The coated glass fragments can cause subcutaneous granulomata if accidentally buried under the skin. Industrial plants have been installing this form of illumination in increasing numbers, and instruction to the maintenance men on proper disposal of the tubes has become a necessity.

This division has been investigating various means for safely breaking these lamps, and has developed a simple device for breaking them under water, with no danger from dust or flying glass.

It consists of a barrel or tube, about 43 in. long and 1⅝ in. in dia., into which a fluorescent tube can be inserted. The upper end is closed by a cap, and the open lower end is immersed in a bucket of water. A pistol-grip lever is attached about two feet above the bottom and a bracket fastened to the barrel an inch or so from the lower end. A tension bar is attached to the lever at one end and to a toggle link in the bottom bracket. One end of the toggle is joined to a sharpened plunger which can move through a hole in the barrel.

To dispose of a fluorescent tube, the lower end of the barrel is put in a bucket of water and the tube is inserted in the upper end. Squeezing the pistol grip activates the toggle mechanism through the tension rod, forcing the sharpened plunger against the wall of the fluorescent tube, fracturing it. The bursting effect is confined within the barrel, and water prevents the dissemination of any dust. When the pistol grip is released, the tube drops to the bottom of the bucket and another section can be broken off by squeezing the grip again. Usually only a few repetitions are necessary to crush an entire tube. If a wire basket is inserted in the bottom of the bucket of water the glass fragments can be readily lifted out and disposed, after which the water can be poured down a drain.

Effect of Clothing on Safety

What essential features of a trackman's clothing affect his safety when at work? How can men be encouraged to wear safe clothes? Explain.

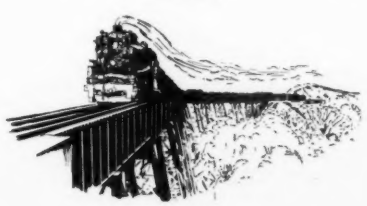
Foremen Should Set Example

By G. M. O'Rourke
Assistant Engineer Maintenance of Way, Illinois Central, Chicago

Our safety rules provide that employees must be suitably shod and clothed to perform their duties safely. They are warned that thin-soled shoes, unbuckled overshoes, long coats, loose, torn or baggy clothing, and trousers with cuffs are dangerous. Employees engaged in work where there is a falling or tripping hazard are advised to fasten the bottoms of their trousers closely around each ankle. It is dangerous to wear ragged, loose or greasy overalls or jumpers, because they are likely to be caught in moving machinery or may catch fire. Employees must not wear wrist watches or finger rings around moving machinery or while handling material. Broken glass must be removed with gloved hands and adequately disposed of. Men are told to wear clothing and shoes that will give full protection when performing gas or electric cutting or welding operations. Wearing torn, oily or greasy clothing when cutting metal by gas or electricity or when performing welding operations is prohibited. Wearing gloves while operating machinery, unless specifically authorized, is prohibited.

The wearing of safety shoes is not specifically mentioned in our safety rules but this is important and should be urged upon all trackmen. Nor is any mention made about headgear, but hats with large, floppy brims that might obstruct vision should be discouraged and, in winter, care should be taken to see that eyes and ears are not covered to such an extent that vision and hearing are impaired. Wages received by trackmen today make it economically possible for them to own and wear the proper kind of clothing.

The manner in which men can be encouraged to wear safe clothes is a part of supervision, and the foreman and supervisor can ordinarily get the desired results by correct handling and encouragement. They should set good examples by wearing correct clothing and safety shoes. They should observe what their men wear when working and discuss the subject on every possible occasion, including safety and staff meetings. To get satisfactory results supervision must be constantly diplomatic and persevering in its encouragement of the wearing of safe clothes.



Teach Men What Is Unsafe

By S. L. Chapin
Safety Supervisor, Southern Pacific, San Francisco, Cal.

There are several essential features of a trackman's clothing that affect his safety while at work. His clothing, as a whole, should fit well to afford freedom of movement but not be loose or baggy. It should be as light as possible, yet heavy enough to give comfortable protection against the elements. In other words, clothing that gives the man the most in comfort and essential protection, allowing him good freedom of movement while working, enhances his over-all safety.

Loose or baggy clothing that might catch in moving machinery should not be worn, and trousers should not have cuffs nor reach below the ankle. Shoes are all-important to the trackman, and should be of the best. Often, there is a tendency to purchase the cheaper grades of work shoes, but this, in the long run, is false economy. The best grade of eight-inch boot, or higher if preferred, with a steel safety toe is an ideal shoe for the trackman. Although such shoes may cost a little more, they will pay big dividends in comfort, long wear and safety. Gloves are also essential as protection against hand and finger injury and should be of the wristlet or short gauntlet type.

Men can best be encouraged to wear safe clothing if the matter is handled along educational lines. It should be made a subject for discussion at safety meetings, and by the supervisor and foreman on the job. Experience has shown that a man will cooperate to the best of his ability when the safety feature of proper clothing is explained to him with the right approach.

Damaged Freighthouse Doors

Under what conditions are freighthouse doorways damaged by delivery trucks? How can such damage be minimized? Explain.

Use Heavy Bumping Blocks

By M. J. Hubbard

General Supervisor Bridges and Buildings, Chesapeake & Ohio, Richmond, Va.

This question touches on a problem of much concern to railroads, yet there is not a lot that can be written about it. Freighthouse doorways and doors receive considerable damage from delivery trucks of various sizes backing into freighthouses for loading and unloading.

If all trucks were of the same size, that is, the length of truck bed overhanging from the rear wheels, the problem could be very easily solved by installing a bumping block in the drive to stop the truck wheels the proper distance from the doorway —allowing the truck bed to clear the door or door casings.

The greater portion of freighthouse doors today are of the upfolding or roller type that will not stand very much abuse from trucks backing into them. If struck repeatedly, they soon become inoperative.

Our best solution to the problem of protecting building and doors has included the use of heavy 12-in. by 12-in. timbers along the outside of the door sill, placed flush with the top of sill and floor in lengths longer than the width of doorway. These timbers are either bolted to the building proper or placed on 12-in. by 12-in. timber posts. This size of timber will generally catch the bed of most trucks.

A heavy upright post each side of the doorway is another form of protection sometimes used to absorb the impact of a truck when it is backing-up to a doorway. Such a post also has a tendency to force the truck driver to spot his truck on the center of the doorway rather than to one side.

Use Big Timber in Doorway

By Leo Denz

Chief Carpenter, Chicago, Milwaukee, St. Paul & Pacific, Chicago

Where freighthouse floors are lower than the floors of auto trucks and trailers we can expect damage to the doors as well as the walls of our freighthouses. This damage can be very expensive as well as unsafe. In large cities such as Chicago, many of the older freighthouses have floors to fit the freight-car floor elevation. The tracks cannot be raised on account of existing street grades or because of overhead viaduct clearances, and the driveways serving the freighthouse doors cannot be lowered on account of adjoining street grades or the grades of adjoining properties and their driveways.

When the freighthouse floor cannot be brought up to the level of the truck or trailer floor, at a height of approximately 48 in. above the driveway, a bulkhead can be built on the door sill consisting of an 8-in. by 16-in. or 10-in. by 18-in. timber laid flat outside with the ends against the walls or pilasters. The top side of the timber is blocked up to approximately 46 in. above the driveway to allow for a 2 in. D&M hardwood wearing surface. The timbers can be notched to fit the walls at the sides of the door. The elevation of the 2 in. D&M flooring can be carried inside the building one or two feet if desired to meet the style of the doors in use. This method will prevent the overhanging bodies of trucks or trailers from striking either the doors or the wall.

Timber blocking on the pavement is not effective unless it is placed approximately four feet from the building on account of the varying distances the bodies of trucks and trailers overhang the rear axle. This kind of protection creates a very unsatisfactory condition for trucks with a short overhang.

Toilet Facilities For Camp Cars

What types of toilet facilities are best adapted for use in camp cars or with camp-car outfits? Explain.

Chemical Toilets Are Used

By Assistant Division Engineer

Sewage disposal facilities in camp cars have been confined, in the past, to the minimum required by local health department regulations or other public demands. Toilet facilities have been varied, and have included in some cases nothing more than parking the cars along a dense grove of trees. Collapsible-frame privies have often been carried with each camp train and set up over pits dug hastily by men who knew little about the sanitary requirements of the work they were doing.

My railroad recognized long ago that these types of sanitary facilities were inadequate for the employees and a definite hindrance to keeping the good will of the communities along its route. All camp cars are now equipped with waterless chemical toilets. Each of these consists of a toilet bowl set in the end of a car with a straight drop into a retention tank which is suspended underneath the car. Both the toilet hoppers and tanks are vented through the roof and the hoppers are enclosed in tight compartments with close fitted doors for odor control.

The retention tanks on these cars must be emptied at frequent intervals, depending to some extent on the number of men in the car. To accomplish this a hole is dug along the side of the car and the chemically-liquefied sewage is emptied into it. This is a simple operation if the cars are not parked too long in one place and if the soil is permeable. Otherwise finding a place to empty the tanks becomes a tedious, never-ceasing chore. After emptying, the tanks are recharged with caustic soda, usually in a prepared, proprietary form.

There are two disadvantages of the use of this type facility. One is the difficulty of emptying the tanks in some circumstances, mentioned above. The other is occasioned by the freezing of the liquefied sewage, and the consequent difficulty in emptying the tanks. This latter disadvantage can be minimized by insulating the tanks, but few, if any, of our cars are so protected. There comes a time during the winter when these tanks must be emptied without further waiting for warmer weather. Thawing them out with kerosene pressure torches can easily result in serious fires. Adequate insulation would eliminate this hazard.

Although chemical toilets are, as far as I know, the "last word" in camp-car sewage disposal methods, there is a possibility that some more convenient and effective method of handling camp-car toilet wastes may come out of the current Sanitation Research Project being conducted by the A.A.R. at the instigation of the U.S. Public Health Service to determine methods of preventing or controlling the discharge of wastes from passenger cars.

Metallizing Bridge Members

How practicable is it to apply metallized zinc, aluminum, lead or other coatings on bridge members or floor systems to minimize corrosion from brine drippings or other causes? How can this be done? Explain.

Metallic Coatings Costly

By J. F. SALMON
Bridge Engineer, Canadian National, Toronto, Ont.

The application of zinc, aluminum, lead or other protective, metallized coatings to bridge members or floor systems, to minimize corrosion from brine drippings or other causes, is undoubtedly an excellent and lasting protection, but is, in my opinion, impracticable under some traffic conditions.

For experimental purposes, in 1934, we sandblast-cleaned and zinc-metallized one of the main 100-ft. deck girders of our multiple-track bridge over Mimico creek, Toronto terminals; and to the best of my knowledge, this was the first time a steel railway bridge had been metallized. At the same time, for comparative purposes, we cleaned and painted the other girder of the same span, using one coat of red lead and two coats of our standard black graphite paint. Today, after 15 years under brine conditions, the standard paint job has about lived its life, whereas the metallized coating on the other girder is still in good condition.

Nowadays, we would probably use the flame method instead of sanding to clean the steel. In any case, it is imperative that the steel be absolutely clean and dry (i.e., free from old paint, dirt, grease, and dew) immediately before metallizing. This condition alone makes the application in the field a very difficult operation. In fact, it would be practically impossible to metallize a bridge adequately under traffic, since deck ties, etc., would have to be moved. Our particular job was carried out with the traffic diverted to another track but, even so, first costs were extremely high. Even taking into consideration the longer life of the work, it is questionable whether there is any great economy in applying metallized coatings to existing bridges, especially in view of present labor costs.

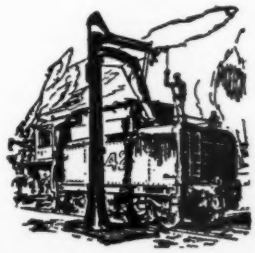
There might be some economical advantage in cleaning and metallizing new fabricated steel in the shop before erection. At least, it would be well worth an experimental installation. It is also considered that the metallizing of the inside of new steel water tanks after erection would be a good practice and might save maintenance costs for many years

Metallizing Is Effective

By JOHN E. WAKEFIELD
Metallizing Engineering Company, Inc., Long Island City, N.Y.

Metallizing deck girders and bridge members with zinc or aluminum is an excellent solution to the corrosion problem caused by brine and stock car drippings. A number of railroads have metallized bridge members during the last 15 to 20 years, and report excellent service life from zinc coatings.

There are several advantages in applying zinc coatings by metallizing. In the first place, the work can be done in place after erection, so that rivets, welds and joints, as well as the members themselves, are thoroughly protected. In the second place, much heavier coatings of zinc can be applied by metallizing than by any other means. Where hot-dip galvanizing, for example, is limited to thicknesses of 0.0005 in. to 0.003 in., metallized zinc coatings are often as thick as 0.02 in. It has been proved that the amount of protection afforded by a zinc coating is in direct proportion to the thickness of the protective coating. The heavier the coating, the greater the number of years of effective protection.



From a series of accelerated tests, carried out in accordance with A.S.T.M. specifications, it can be safely predicted that a 0.012-in. to 0.015-in. coating of zinc will withstand the corrosive action of salt atmosphere from 15 to 30 years, and a coating of 0.010 in. to 0.012 in. of zinc will stand salt water immersion for 10 to 20 years.

The metallizing procedure is relatively simple. First, the surfaces are thoroughly blasted with a good grade of hard (preferably silica or flint) angular washed sand of 16 to 20-mesh size. The purpose in sand-blasting is two-fold. First, to clean the surface of any rust, scale or other foreign matter which may be there, and, second, to roughen the surface to provide mechanical anchorage for the sprayed zinc particles as they land on the work. It is important to understand the dual purpose of sand-blasting because early failures of zinc coatings were almost entirely attributable to lack of proper preparation.

Once thoroughly blasted and ready for metallizing, the surface is sprayed with zinc with an ordinary wire-type metallizing gun. First passes are sprayed across the surface in one direction. The second pass is applied in a direction at right angles to the first, the third at right angles to the second, and so on. By alternating the direction of the passes, very uniform coatings can be obtained and low spots eliminated.

The best procedure for this type of work is to measure out a certain given area which can be coated during the course of one shift. Knowing that it takes approximately ½ lb of sprayed zinc per 0.010 in. thickness, it is possible to weigh out the amount of zinc which is to be applied to the predetermined area. By the application of passes in alternate layers, the correct amount of zinc can be spread quite uniformly over the surface. However, for more accurate determination of thicknesses, an electric thickness gage is advisable. These gages measure the thickness of non-magnetic coatings on magnetic bases with remarkable accuracy.

Another advantage of metallizing is the fact that the thickness can be

varied in accordance with the actual corrosive conditions. In a great many cases, certain sections of a bridge girder are subject to much more severe corrosion than other sections. Where corrosion is mild, the coating can be 0.006 in. thick, and where corrosion is quite severe, the thickness can be increased to any desired amount.

If paint is desired for appearance, it can be applied very readily over the zinc sprayed coating. There is a certain amount of texture in sprayed zinc and this provides an excellent bond for paint.

Twenty-Year Life Expected

By J. R. Showalter
Bridge Engineer, Missouri Pacific, St. Louis, Mo.

Metallizing certain parts of steel bridges on the Missouri Pacific was first tried on one of our Kaw River bridges at Kansas City in 1936. Since then we have used this application on numerous bridges and it is now our policy to cover the top flanges of floorbeams and stringers and the top flanges of beam and girder spans with zinc in all new steel structures before they are erected.

Briefly, the metallizing process consists of spraying molten non-corrosive metal on thoroughly cleaned surfaces by using a special gun, something on the order of a paint spray gun. The non-corrosive metal feeds through the center of the gun in the form of wire. At the base of the gun three hoses are attached, one carrying compressed air, another oxygen and a third acetylene. As the metal wire passes out of the gun through a nozzle, it is transformed into a molten state by an oxygen-acetylene flame and this molten metal is forced into a spray by the compressed-air jet. This mist-like metal spray cools rapidly after being discharged from the gun's nozzle and is practically cold when it strikes the steel surface to which the protective coat is being applied. Since the resulting bond is merely mechanical, a thorough cleaning and proper preparation of the metal surface is of vital importance.

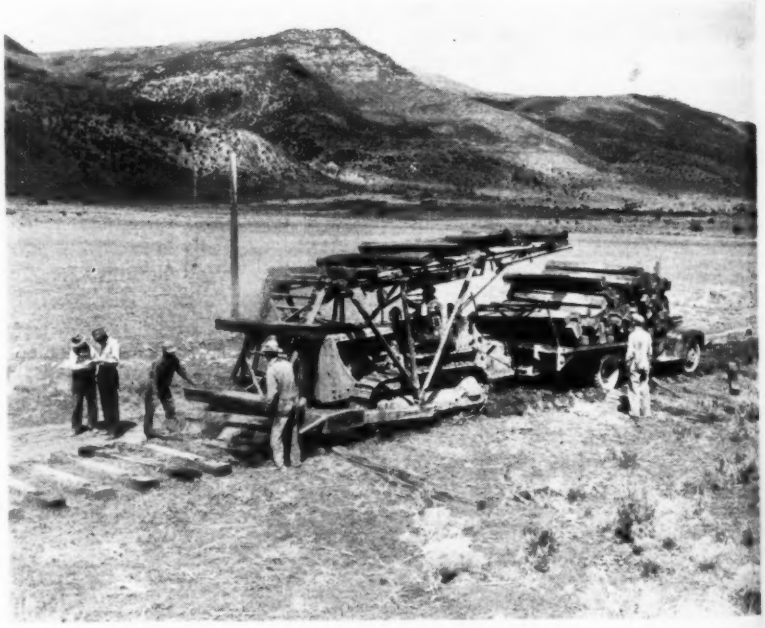
The most practicable and thorough method of cleaning the steel surfaces which are to be metallized is by sandblasting. This necessitates the use of a very hard, flint-like sand, thoroughly dried and screened. This is done not only to remove all paint, rust scale, salt, moisture or other foreign matter but also to roughen the metal surface to insure adequate bond between the zinc and the structural steel. The spray must be applied immediately after the sandblasting is performed and before any water, dirt or other foreign matter comes in contact with the prepared surface.

On most of our work we are using zinc but have also used aluminum on certain parts of coaling stations and cinder conveyors. Any metal, from copper to stainless steel, can be sprayed in like manner provided it is obtainable in wire form. Our metallizing equipment consists of a metallizing gun, complete with controls and hoses; an air respirator; a 1000-lb. capacity sandblast generator unit, complete with hoses and nozzles; and a sand-drying unit and screen. A 160-cu. ft. capacity air compressor is required if sandblasting and metallizing are done at the same time.

The cost of this work is approximately $0.75 to $1.00 per sq. ft. of area covered when the application is made before the structure is erected. When the application is made to structures in service, the cost will run approximately $1.25 to $1.50, depending upon the density of traffic and weather conditions during the period of application.

The results obtained from our first job were not entirely satisfactory as the effective life of this coating is practically gone after 13 years. This was due to: (1) Failure to clean the metal thoroughly; (2) too long an interval before applying the spray coating after sandblasting the metal surfaces; (3) too thin an application of the metal coating (0.008 in.); our standard metallizing application is now 0.012 in. thick.

We believe we will obtain 20 years of life from this protective coating when properly applied and that this method of protecting structural steel members in railroad bridges from the destructive effects of brine drippings and other corrosive agents is practicable, economical and effective.

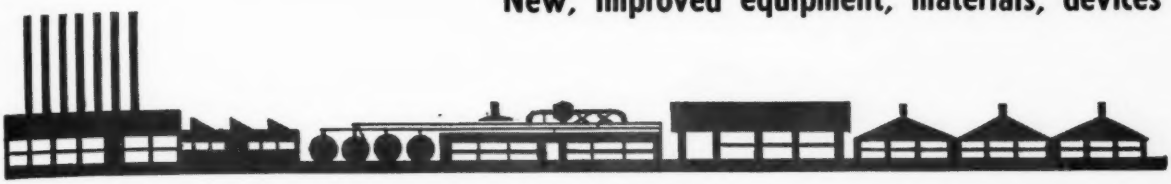


Tractor-Mounted Tie Loader

THE Morrison-Knudson Company, Inc., Boise, Idaho, used this special machine to speed the work of taking up and loading the crossties from an abandoned line of the Denver & Rio Grande Western. The line involved extended between Morosi, Utah, and Nephi, and was about 23 mi. in length. The tie-loading unit consisted of a Caterpillar D6 crawler tractor on which was mounted a device incorporating a shoe for plowing up the ties and an endless chain conveyor for carrying them back over the tractor and dumping them on a truck. The latter was coupled to the tractor in such a manner that it was pulled along behind the machine in the reverse direction. With this machine 2800 to 3500 ties (1 to 1¼ mi. of track) were loaded each day. Five trucks were kept busy. The haul for the trucks was about five miles.

PRODUCTS OF MANUFACTURERS

New, improved equipment, materials, devices



(For additional information on any of the products described in these columns, use postcards, page 735)

ELECTRIC DRILL FOR HEAVY-DUTY WORK

THE Mall Tool Company, Chicago, has announced an electric drill with a capacity of 1¼in., especially designed for heavy construction and maintenance drilling work. It is called the Model 540 A Mall Drill.

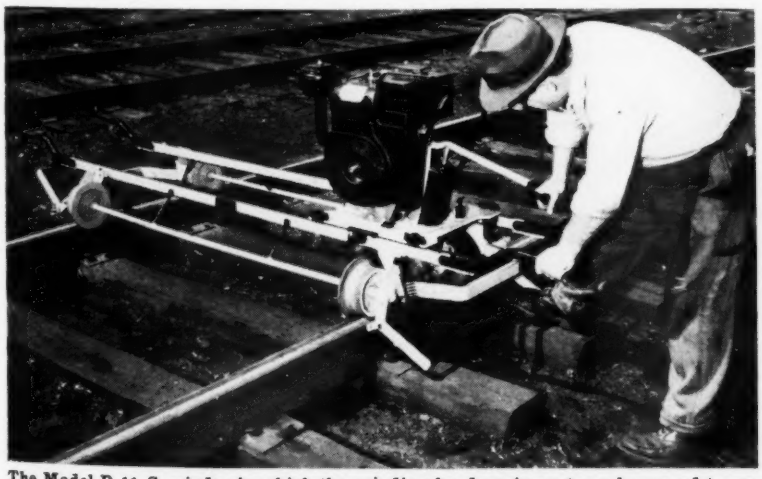
The Model 540 A Mall drill in operation. With a capacity of 1¼ in., it is designed for drilling metal and wood, driving lag screws and running nuts

Special features of the drill include a heavy duty, 115-volt, a.c. or d.c. Universal motor (also available for 230-volt operation), an on-and-off switch on the control handle, an interlocking reverse switch, a detachable side pipe handle, Timken roller bearings, a No. 3 Morse taper, and a triple gear reduction. Optional equipment for the drill includes a ⅝-in. Jacobs chuck, a slip clutch that can be set for predetermined pressures, and socket wrenches with capacities ranging from ⅞ in. to 1½ in.

RAIL-JOINT CROSS GRINDER

THE Railway Track-work Company, Philadelphia, Pa., has announced a rail-joint cross grinding or slotting machine, designated as Model P-11-S, which can be used on either rail without turning the machine. This feature has been made possible by mounting the gasoline engine and the grinding equipment on a combination carriage and turntable in such a way that the grinder can be moved from one rail to the other and at the same time turned through 360 deg. The carriage is mounted on a transverse track on the main frame of the machine, and runs on ball bearings. The frame is mounted on four flanged wheels and is equipped with handles for lifting the machine from the track.

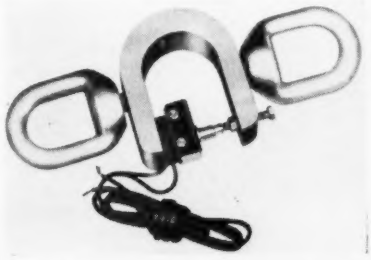
The grinder, driven by V-belts, is fed by a handle which is hinged and mounted on a large coil spring for easy operation and accurate control of cutting depth. Each end of the main frame is equipped with a pivoted, foot-clamping device, by means of which the machine is held firmly against the rail during slotting operations. Removal of the foot automatically releases the clamp.



The Model P-11-S grinder in which the grinding head equipment can be moved transversely across the track and reversed on a turntable

DYNA-SWITCH FOR HOIST PROTECTION

W. C. DILLON & Co., Inc., Chicago, has announced an improved model of the Dillon Dyna-Switch—



The Dillon Dyna-Switch for protecting hoists or cranes from overloading

a device for protecting hoists or cranes against damage due to accidental overloads. It consists essentially of a U-shaped steel bar which is suspended between the hoist or crane hook and the load by eye bolts, a micro-switch, which is actuated by the flexing of the U-bar as loads are lifted, and a rubber-covered cable which connects the switch to the hoist-motor circuit.

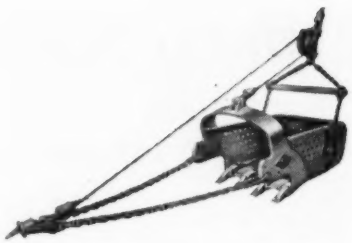
Normally the circuit of the switch is closed. If, when lifting a load, the capacity of the hoist is exceeded, the U-bar flexes an amount sufficient

to break the circuit, thereby cutting out the motor. The circuit remains open until the operator presses a switch to reverse. The excess load must then be removed before the hoist will again pick up. Hoist motors with capacities up to ¾ hp. can be handled directly by the Dyna-Switch; those of greater power are worked through an intermediate relay.

The switch can be set to cut out a hoist motor under any predetermined load weighing between 500 lb. and 10,000 lb. Its cut-off setting can be changed in the field simply by suspending a known weight from the unit and adjusting a set screw.

LIGHTWEIGHT BUCKETS FOR DRAGLINE WORK

THE Pettibone Mulliken Corporation, Chicago, has added to its line of buckets and dippers a series of Featherweight Perforated Dragline



Lightweight, wide-set corner teeth and a sharp cutting edge are among the features of the Pettibone Mulliken Featherweight Perforated Dragline buckets

Buckets which, in each capacity, are said to be 20 per cent to 40 per cent lighter than buckets of conventional construction.

The buckets are of welded construction. The lip-and-socket-point type teeth, sheave, wire-rope sockets and dump-chain links are all made of 14 per cent manganese steel. Design features of the buckets include wide-set corner teeth and a sharp cutting edge, which minimize the draw-bar pull and distance required to fill the bucket.

New Books

MODERN PRACTICE IN RAILROAD ENGINEERING

MODERN Railroad Structures, by Charles P. Disney and Robert F. Legget. 642 pages, illustrations. Published by the McGraw-Hill Book Company, New York. Price $5.00.

THIS is a record of modern types of railroad bridges and a review of improved techniques for modernizing old structures. Written from a practical point of view by men highly qualified in the field (Mr. Disney was associated with the Canadian National for more than 40 years, the last 27 years of which he was bridge engineer on the Central region, and Mr. Legget was formerly associate professor of civil engineering at the University of Toronto), the book should prove both interesting and useful to those engaged in the maintenance, construction and rehabilitation of railroad bridges.

Since all structures must transmit their loads to the ground, the book begins, logically, with a summary of the modern study of soil mechanics. The following chapters deal, in order, with railway bridges of different types; the maintenance and repair of existing bridge structures, particularly of bridge piers; the design and re-design of turntables; and finally with new methods in concrete construction, with special emphasis on the advantages of Intrusion-Prepakt concrete. The numerous illustrations in the book are interesting and well chosen.

METALLURGY APPLIED TO WELDING

WELDING Metallurgy—Iron and Steel, by O. H. Henry and G. E. Claussen, second edition, revised by G. E. Linnert. 505 pages, illustrations. Bound in blue cloth covers. Published by the American Welding Society, New York. Price $2.50.

THIS edition has been revised to include information on new processes that have been introduced since publication of the first edition nine years ago. Material on inert-gas metal-arc welding has been added as well as more information on the metallurgy of specific alloys, such as stainless, heat-resisting, and stainless-clad steels. Also a short bibliography has been incorporated at the end of each chapter to suggest sources of additional material on the particular subject of the chapter, and an extensive index has been added to make the book more useful as a reference. The number of pages in the book has been increased by 150, and the number of illustrations to a total of 203.

ENGINEERS HANDBOOK

FIELD Engineering—Text and Tables. By Searles, Ives and Kissam. Twenty-second edition. 422 pages. Illustrated. 4½ in. by 6½ in. Bound in leatherette. Published by John Wiley & Sons, Inc., New York. Price, text section, $3.50; tables, $3.50. Combined volume, $6.50.

IN this most recent revision of this well-known field manual, the author—Phillip Kissam, professor of civil enginering, Princeton University—has clarified the text thoroughly and brought it up to date. Many passages have been rewritten, more than 40 new illustrations have been included and considerable new material has been added, including a new first chapter outlining the fundamentals of railway and highway location. In short, the book has been completely overhauled.

Of special interest to railway men are a discussion of the advantages of air mapping, a new method of completing the compound curve theory, a new method of positioning turnouts on curved track, a complete theory of the vertical curve, and an improved method of string lining.

FIELD ENGINEERING

ROUTE Surveying, by George Wellington Pickels and Carroll Carson Wiley. Third edition. 434 pages, pocket size, bound in flexible covers. Published by John Wiley & Sons, Inc., New York. Price $4.75.

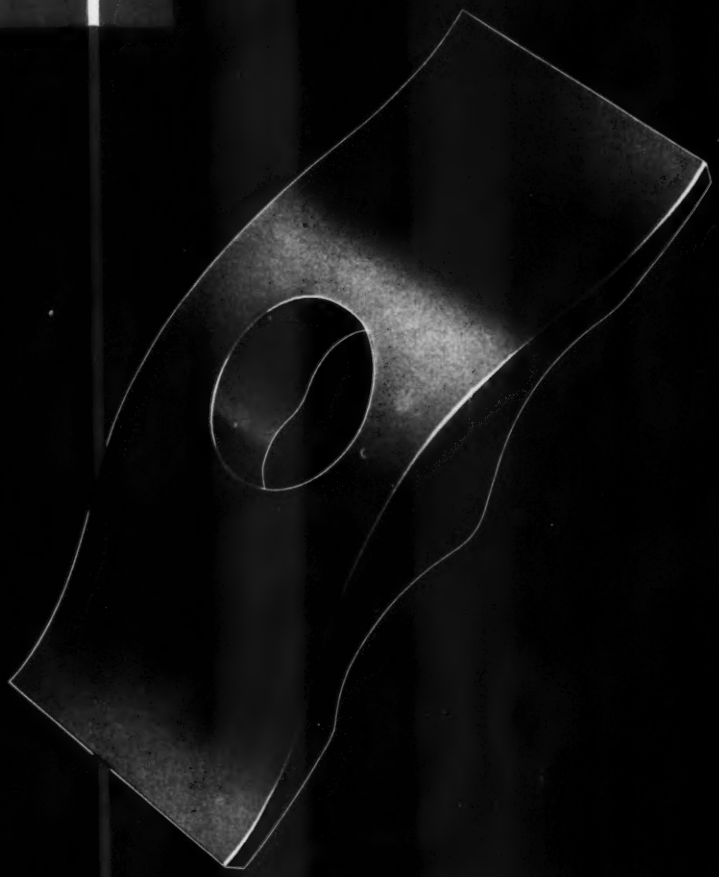
THE most recent edition of this handbook, while retaining the general character and makeup of previous editions, has been revised to bring it up to date and to make it more usable for both students and field engineers. The revisions are designed to clarify certain points, to present new concepts and methods, and to give new data.

The largest single revision involves the chapter on String-lining, which has been completely rewritten. It now includes both the Portser and A.R.E.A. methods instead of only the latter as in the second edition. Other major revisions have been made in the chapters on Distance, Curvature and Grades; Circular Curves; Spirals; and Earthwork. A number of important changes have been made in the tables, the most interesting being the omission of all logarithmic tables. This was done because calculating machines have largely replaced manual computations. Also, the five-place tables of natural trigonometric functions have been replaced with seven-place tables to meet the need for greater accuracy in many curve computations.

THE WORLD'S *Finest* SPRING WASHER

No spring washer for track bolts should go flat before reaching a practicable and workable bolt tension. Ordinary washers do *not* meet this *fundamental* requirement. The VERONA *Fixed* TENSION TRIFLEX SPRING, in *addition* to furnishing this required free travel to reach adequate bolt tension, provides the means of applying *equal tension to all bolts.*

...and the* VERONA *Fixed* TENSION TRIFLEX SPRING *has the highest reactive pressure of any spring washer on the market.



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We also make a complete line of alloy coil washers to A.R.E.A. 1948 requirements.

THE MONTH'S NEWS

Happenings among the railways—the associations—the suppliers

Changes in Railway Personnel

General

C. H. Hardwick, district maintenance engineer on the Chicago, Rock Island & Pacific at Des Moines, Iowa, has been promoted to superintendent of the Arkansas division, at Little Rock, Ark.

William T. Rice, superintendent of the Potomac yard of the Richmond, Fredericksburg & Potomac, at Alexandria, Va., and an engineer by training and experience, has been promoted to the newly-created position of superintendent of that road at Richmond, Va.

Charles J. Geyer, who has been elected vice-president, maintenance of way, and construction, Chesapeake & Ohio system, which embraces the Pere Marquette and Chesapeake district, as announced in the July issue, is 69 years old and was born in Zanesville, Ohio. Mr. Geyer was educated at Marshall College, and began his railroad career with the C. & O. as a rodman in 1908, serving in the construction department in Huntington, W. Va. He was advanced to assistant engineer in 1914, to division engineer in 1918, to assistant superintendent maintenance of way in 1924, and to engineer maintenance

Charles J. Geyer

of way in 1926. Mr. Geyer was promoted to assistant to the vice-president in 1929, and became general manager of the C. & O. in 1943. In 1947 he was appointed assistant vice-president, which position he held at the time of his recent election as vice-president.

Engineering

T. B. Hutcheson, assistant to the chief engineer of the Seaboard with headquarters at Norfolk, Va., has been promoted to assistant chief engineer, with the same headquarters, succeeding **C. H. Burks,** who has been appointed division engineer at Jacksonville, Fla., to succeed **J. R. Traphoner,** who has been transferred to Tampa, Fla. **R. E. Tew,** division engineer at Americus, Ga., has been

T. B. Hutcheson

promoted to assistant to chief engineer to succeed Mr. Hutcheson, and **W. R. Fudge,** assistant division engineer at Atlanta, Ga., has been promoted to division engineer to succeed Mr. Tew.

Mr. Hutcheson was born in Gloucester, Va., and is a graduate of Virginia Polytechnic Institute. He joined the Seaboard in 1935 and served at Tampa, Fla., Savannah, Ga., and Atlanta, Ga., until 1942, when he entered military service. After being discharged in 1946 with the rank of major, he returned to the Seaboard as assistant division engineer at Atlanta, Ga., and later served in this capacity at Raleigh, N. C., before being advanced to assistant to the chief engineer last year.

Mr. Burks, a graduate of Georgia Institute of Technology, began service with the Seaboard in 1933 and has served at Atlanta, Ga., Hamlet, N. C., and Savannah, Ga., in various positions, including assistant to division engineer and division engineer. He was appointed assistant chief engineer in 1946.

R. E. Tew

Mr. Tew, a native of Portsmouth, Ga., is a graduate of North Carolina State College. He joined the Seaboard in 1933 as apprentice section foreman at Birmingham, Ala., and subsequently served as assistant to division engineer and division engineer at Savannah, Ga., before going to Americus in 1947.

Mr. Fudge, a native of South Carolina and a graduate of Clemson College, joined the Seaboard in 1943 and served as assistant to division engineer and assistant division engineer at Hamlet, N. C., before entering the Marine Corps in 1944. He returned to the Seaboard in 1946, being appointed to the position which he held at the time of his recent promotion.

A. E. Botts, assistant chief engineer (maintenance) of the Chesapeake & Ohio, with headquarters at Richmond, Va., has retired after 41 years of service with the C. & O.

L. S. Crane, assistant engineer of tests of the Southern, has been promoted to engineer of tests, with headquarters as before at Alexandria, Va.

E. W. Falanders, assistant engineer on the Atchison, Topeka & Santa Fe, has been appointed engineer of inventories, with headquarters at Chicago.

B. A. Bertenshaw, assistant engineer of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Cincinnati, Ohio, has retired.

Harold S. Ashley, engineer of track of the Boston & Maine, at Boston, Mass., has been promoted to assistant engineer maintenance of way, with the same headquarters, succeeding **John P. Canty,** who has resigned after 59 years of service.

(*Please turn to page* 784)

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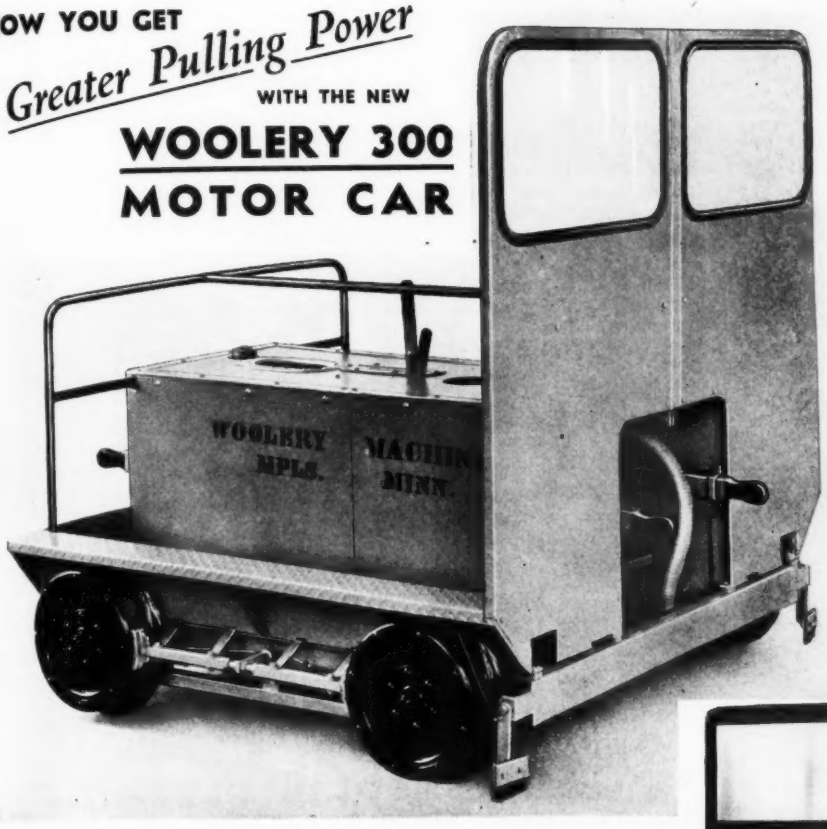
Greater Pulling Power

WITH THE NEW

WOOLERY 300 MOTOR CAR



FEATURING

- New 4 wheel drive
- New selective differential
- Woolery 2 speed transmission, forward and reverse
- New self centering cast iron brake shoes on all 4 wheels
- 10 HP air cooled engine
- One man can remove from rails at a crossing
- Carries 8 men and track tools

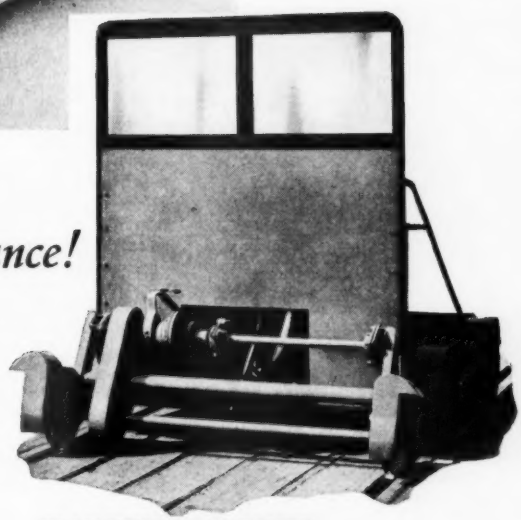
The Light Weight Motor Car . . . with Heavy Duty Performance!

The WOOLERY 300 Motor Car sets a new standard for motor car performance. Designed for heavier loads, greater dependability, and easier handling by extra gang or section crews, the WOOLERY 300 Motor Car provides new features that make it more adaptable to modern track maintenance.

Efficiently designed . . . sturdily built . . . compact, the WOOLERY 300 is powered by a 4 cycle air cooled engine (either Onan or Wisconsin) that reduces car weight, eliminates anti-freeze in winter, and provides pulling power usually found only in far heavier cars. New selective differential permits use of 4 wheel drive and still provides differential action when removing car from tracks.

TESTS PROVE PULLING POWER

In recent tests, the new WOOLERY 300 Motor Car with 4 wheel drive providing greater traction, easily pulled 15,000 pounds. Greater pulling power is only one of the many advantages of the "300".



FLANGEWAY CLEANER IS QUICKLY ATTACHED

In winter, when track conditions require the safety of clean flangeways, a WOOLERY Flangeway Cleaner is quickly added with only 6 bolts. This provides you with an efficient self-propelled unit that cleans both flangeways at one time. Sanders may also be added for wintertime use if desired.

WRITE FOR NEW BULLETIN #178 giving complete specifications of the WOOLERY 300 MOTOR CAR.

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Railway Personnel (Cont'd)

S. M. Percival, superintendent of the High Point, Randleman, Asheboro and Southern and of the Yadkin Railroad (Southern Railway subsidiary lines) at Salisbury, N. C., has been appointed chief engineer and superintendent of the Atlantic & Danville.

Hugh W. Johnson, assistant chief engineer of the Chicago Great Western, has been promoted to chief engineer, with headquarters at Chicago, succeeding **W. C. Groth,** who has retired after 43 years of service.

M. P. Black, special engineer of the Illinois Central at Chicago, has been appointed assistant chief engineer of the New Orleans Union Passenger Terminal, with headquarters at New Orleans, La.

J. F. Dunseth, supervisor of road on the Baltimore & Ohio at Zanesville, Ohio, has been appointed assistant division engineer, on the Toledo division, with headquarters at Dayton, Ohio, where he succeeds **C. E. Herth,** who has retired.

R. W. E. Bowler, engineer maintenance of way of the Northern division of the Pennsylvania, with headquarters at Buffalo, N. Y., has retired. As announced in the July issue, Mr. Bowler has been succeeded by **C. R. Montgomery,** formerly division engineer of the Eastern division.

H. P. Morgan, supervisor of track on the Pittsburgh division of the Pennsylvania, with headquarters at Cresson, Pa., has been promoted to assistant division engineer, special duty, in the office of the chief engineer at Philadelphia, succeeding **C. L. Towle,** who has been appointed assistant engineer, office of chief engineer, Central region, at Pittsburgh.

Frank R. Woolford, engineer maintenance of way and structures of the Western Pacific at San Francisco, Cal., has been promoted to chief engineer at that point, succeeding **Thomas L. Phillips,** who has retired after nearly 44 years of service with the W. P. **W. T. Richards,** division engineer, Western division, with headquarters at Sacramento, Cal., has replaced Mr. Woolford and has been succeeded by **C. E. Elliott,** estimating engineer.

Paul S. Settle, Jr., recently promoted to assistant division engineer of the Maryland division of the Pennsylvania, with headquarters at Altoona, Pa., as reported in the June issue, was born on October 26, 1914, at Philadelphia, Pa. Mr. Settle received a B.S. degree in civil engineering from Lehigh university in 1936, and joined the Pennsylvania as engineer apprentice in June of the same year. Six months later he was advanced to assistant on engineer corps, being assigned successively to the office of the chief engineer maintenance of way at Philadelphia, to a rail train, and to the Philadelphia Terminal division. On September 29, 1938, he became a trackman at Philadelphia and on October 16, 1938, he returned to the position of assistant on engineer corps, first at Columbia, Pa., and later at Elmira, N. Y. Mr. Settle was promoted to assistant supervisor of track, with headquarters at Barnesboro, Pa., on October 16, 1940, later being transferred to Wilmington, Del. On April 9, 1942, he was promoted to supervisor of track at Logansport, Ind., and later served in this capacity at Piqua, Ohio, and Perryville, Md. He was located at the latter point at the time of his recent promotion.

C. E. Vick, whose promotion to engineer maintenance of way of the Charleston & West Carolina (a subsidiary of the Atlantic Coast Line) with headquarters

C. E. Vick

at Augusta, Ga., was announced in the June issue, was born at Nashville, N. C., on June 25, 1901. Upon graduation from North Carolina State College with a B.S. degree in engineering in June, 1925, he entered the service of the A. C. L. as rodman at Waycross, Ga. After serving as transitman and junior engineer, he was appointed assistant engineer August 1, 1930. On June 1, 1939, he was promoted to office engineer; to senior assistant engineer on May 1, 1940; to division engineer on August 1, 1942, and to roadmaster, the position he held at the time of his recent promotion, on November 1, 1943.

Frederick L. Thompson, whose appointment as division engineer of the Baltimore & Ohio, with headquarters at Wheeling, W. Va., was reported in the April issue, was born at Lynch Station, Va., on January 7, 1902. He received his B.S. in civil engineering from Virginia Military Institute in 1924, and entered railroad service with the B. & O. on July 17, 1927, as a rodman at Grafton, W. Va. In February, 1929, he was advanced to assistant on the engineering corps at Akron, Ohio, subsequently serving as crossing watchman and extra gang foreman at Ravenna, Ohio. In January, 1935, he was furloughed from the B. & O. and served for two years as junior engineer, civilian corps, U. S. Army Engineers, at Zanesville and Loudonville, Ohio, on the Muskingum River Watershed Conservation Project—Eastern Ohio. On returning to the B. & O. he served in various positions as assistant on corps at Cincinnati, until April, 1944, at which time he was appointed assistant engineer, with the same headquarters. In November, 1945, he was promoted to assistant division engineer at Newark, Ohio, being transferred, in the same capacity, in June, 1946, to Cincinnati, where he remained until his recent promotion.

R. W. Lucas, roadmaster on the Chicago, Rock Island & Pacific at La Salle, Ill., has been promoted to district maintenance engineer of the Third district, with headquarters at El Reno, Okla., succeeding **R. C. Violett,** retired. **J. W. Shurtleff,** roadmaster at Topeka, Kan., has been promoted to district maintenance engineer of the First district at Des Moines, Iowa, succeeding **C. H. Hardwick,** whose promotion to superintendent is noted elsewhere in these columns. These changes were effective July 1.

Earl F. Snyder, division engineer of the Illinois Central at Jackson, Tenn., has been transferred to Champaign, Ill., succeeding the late **William Richard Gillam. Lee W. Howard,** supervisor of track at Corinth, Miss., has succeeded Mr. Snyder.

The jurisdiction of **H. B. Barry,** chief engineer of the St. Louis-San Francisco, with headquarters at Springfield, Mo., has been extended to include the maintenance of way and structures department. **E. L. Anderson,** assistant chief engineer, maintenance, at Springfield, and **B. H. Crosland,** assistant chief engineer at that point, have been appointed assistant chief engineers, Eastern and Western districts, respectively, with the same headquarters.

Track

A. B. Carroll has been appointed track supervisor on the Atchison, Topeka & Santa Fe, with headquarters at Trinidad, Colo. **C. L. Meimbach** and **F. J. Myers** have been appointed roadmasters at Albuquerque, N. Mex., and Amarillo, Tex., respectively. **B. F. Wyrick** has been appointed assistant roadmaster, with headquarters at La Junta, Colo.

George H. Turman, roadmaster on the Atchison, Topeka & Santa Fe, with headquarters at Arkansas City, Kan., has been promoted to track supervisor on the Oklahoma division, where he will succeed **H. E. Gooch,** who has been assigned to other duties. **J. A. Keithly** has been appointed assistant roadmaster on the Atchison, Topeka & Santa Fe, with headquarters at La Junta, Colo., succeeding **B. F. Wyrick,** who has been assigned to other duties.

R. E. Weaver, section foreman on the North Florida division of the Seaboard Air Line, has been promoted to assistant roadmaster on the Canadian division with headquarters at Savannah, Ga. **H. C. Exley,** assistant roadmaster on the Carolina division of the Seaboard Air Line, with headquarters at Savannah, Ga., has been promoted to roadmaster on the Alabama division at Cuthbert, Ga., succeeding **G. G. Perry,** who retired on July 1 after 41 years of service.

(*Please turn to page* 786)

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Railway Personnel (Cont'd)

Major D. Farley, roadmaster on the Pocahontas division of the Norfolk & Western, with headquarters at Bluefield, W. Va., recently retired.

H. C. Thomas, roadmaster of the Tennessee Central, has been appointed general roadmaster, with headquarters at Nashville, Tenn. **M. C. Judd,** section foreman, has been promoted to assistant roadmaster with headquarters also at Nashville.

John C. Beeler, track supervisor of the Southern at Sheffield, Ala., has been transferred to Huntsville, Ala., where he succeeds **W. Paul Higginbottom,** whose transfer to Buntyn, Tenn., was reported in the July issue.

H. G. McKay, roadmaster on the St. Thomas division of the Canadian National, with headquarters at St. Thomas, Ont., has been transferred to the Belleville division, at Belleville, Ont., to succeed **G. T. Yerrow,** retired. **H. L. Scott** has been appointed roadmaster on the St. Thomas division to replace Mr. McKay.

M. K. Clark, assistant supervisor of track on the Maryland division of the Pennsylvania, with headquarters at Wilmington, Del., has been promoted to supervisor on the Grand Rapids division, at Grand Rapids, Mich., where he replaces **W. N. Taggart,** who has been transferred to the Monongahela division at Shire Oaks, Pa., succeeding **E. M. Hodges.** Mr. Hodges, in turn, has been moved to Warsaw, Ind., on the Ft. Wayne division to succeed **H. A. Spruill,** who has been transferred to the Pittsburgh division, at Cresson, Pa., where he replaces **H. P. Morgan,** whose promotion to assistant division engineer is noted elsewhere in these columns. **W. S. Marshall,** junior engineer on the Western region, has been promoted to assistant supervisor at Aspinwall, Pa., on the Conemaugh division, succeeding **D. R. Wolfe,** who has been transferred to Wilmington to succeed Mr. Clark. These changes were effective on July 1.

Incident to the discontinuance of the track supervisor system on the Chicago, Rock Island & Pacific, a considerable number of changes have taken place among roadmasters. The following appointments have been made: **F. M. Hardwick** as roadmaster at Des Moines, Iowa; **J. L. Lynch** as roadmaster at Oelwein, Iowa; **M. Johnson** as roadmaster at Lakota, Iowa; **F. E. Detter** as roadmaster at Limon, Colo.; **O. S. Gibson** as roadmaster at Liberal, Kan.; **H. W. Deakin** also as roadmaster at Liberal; **C. M. Berry** as roadmaster at Amarillo, Tex.; **J. R. Wright** as roadmaster at Haskell, Ark.; **E. Rohloff** as roadmaster at Wichita, Kan.; **H. L. Kelley** as roadmaster at Haileyville, Okla.; **W. H. Southall** as roadmaster at Waurika, Okla.. **R. D. Anderson** as roadmaster at Manhattan, Kan., and **J. G. Brimer** as roadmaster at Eldon, Mo. In addition, **A. N. Stamos,** roadmaster at Phillipsburg, Kan., has been transferred to Lincoln, Neb.; **J. H. Fenno,** roadmaster at Amarillo, has beens transferred to another territory with the same headquarters; **W. F. March,** roadmaster at Des Moines, has been transferred to Eldin, Iowa; **V. W. Reed,** roadmaster at Sibley, Iowa, has been transferred to Ellsworth, Minn., and **Roy Stephenson** has been transferred as roadmaster from St. Joseph, Mo., to Trenton, Mo.

Other recent changes on the Rock Island include the appointment of **R. D. Scott** as roadmaster at Pratt, Kan., to succeed **L. E. Cox,** who has been transferred to Topeka, Kan. Mr. Cox succeeds **J. W. Shurtleff,** whose promotion to district maintenance engineer is noted elsewhere in these columns. **John Burns** has been appointed roadmaster at La Salle, Ill., to succeed **R. W. Lucas,** whose promotion to district maintenance engineer is also announced elsewhere. **A. Mills** has been appointed roadmaster with headquarters at Peoria, Ill., succeeding **J. W. Loftus,** who has been transferred to Iowa City, Iowa, to succeed **C. B. Murray,** who has been transferred to Des Moines.

V. Bernard Siems, Jr., whose promotion to supervisor of track on the Williamsport division of the Pennsylvania at Northumberland, Pa., was noted in the April issue, was born in Baltimore, Md., on May 22, 1920. He attended the College of the City of New York and received his B.S. in civil engineering in 1942. He entered railroad service with the Pennsylvania in July of that year as an engineer apprentice on the Maryland division at Baltimore, Md., and Wilmington, Del. In November, 1942, he was furloughed for military service, serving as an aircraft maintenance engineering officer in India and Burma with the 10th Air Force. On returning to the Pennsylvania in March, 1946, Mr. Siems was appointed assistant on the engineering corps on the Maryland division at Perryville, Md. In February, 1947, he was advanced to assistant supervisor of track on the Erie and Ashtabula division at Niles, Ohio, the next month being transferred to the Cleveland division at Cleveland, Ohio, and to the Eastern division, at Freedom, Pa., the following July. He remained at the latter point until his recent promotion to supervisor of track.

Hugh T. Alexander, whose promotion to supervisor of track on the Buffalo division of the Pennsylvania, with headquarters at Olean, N. Y., was reported in the May issue, was born in Owen County, Kentucky, on November 1, 1920. He received his education at the University of Cincinnati, graduating in civil engineering in 1943. Mr. Alexander began his railroad service with the Pennsylvania, working as a chainman on the Cincinnati division during the period of November 1, 1941 to July 12, 1943, while not in school. On the latter date he was furloughed for military service (180th F.A., 26th Inf. Div.), returning to the Pennsylvania on February 20, 1946, as assistant on the engineering corps on the Fort Wayne division at Valparaiso, Ind. On November 1, 1946, he was transferred to the Indianapolis division at Indianapolis, Ind., being advanced to assistant supervisor of track on the Philadelphia division at Enola, Pa., on January 16, 1947, from where he was transferred, on June 10, 1947, to the Eastern division at Mansfield, Ohio, remaining at the latter point until his recent appointment.

Bridge and Building

C. G. Watts, bridge and building foreman of the Tennessee Central, has been appointed acting supervisor of bridges and buildings, with headquarters at Nashville, Tenn.

P. B. Collier, supervisor of bridges and buildings of the Missouri Pacific at St. Louis, Mo., has been appointed superintendent of scales at that point, succeeding **F. H. Schlinkert,** who has retired after 54 years of service.

E. L. MicZanko, assistant general foreman in the bridge and building and water service department of the Atchison, Topeka & Santa Fe, with headquarters at San Bernardino, Cal., was appointed acting general foreman in the same department to replace **W. F. Martens,** who has been promoted.

Special

W. E. Kemp has been appointed superintendent, timber preserving plant, on the Norfolk & Western, with headquarters at Radford, Va., succeeding **C. S. Wiltsee, Jr.,** retired, and **H. C. Martin** has been appointed treating supervisor, timber preserving plant, at Radford.

Obituary

Fred R. Puder, retired division engineer on the Denver & Rio Grande Western, died in Chicago on May 3.

Robert S. Abel, retired track supervisor on the Illinois Central, died on April 20 at Memphis, Tenn., following a long illness.

Edward G. Hutchings, retired master carpenter of the Buffalo division of the Pennsylvania, died at Park Ridge, N. J., on July 2. He was 74 years old.

Kenneth P. Howe, assistant engineer water supply on the Louisville & Nashville, with headquarters at Louisville, Ky., died on May 26, as a result of a heart attack.

Streeter H. Ballard, division engineer on the Alleghany division of the Erie, who had been in the service of the railroad since 1914, died at his home in Hornell, N. Y., on April 7.

William Richard Gillam, division engineer of the Illinois Central, with headquarters at Champaign, Ill., died recently in the I. C. hospital at Chicago after an illness of three months. Mr. Gillam was in his 50th year of service with the I. C.

(*Please turn to page* 788)

Wire:

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Association News

Railway Tie Association

The annual convention of the association will be held in the Hotel Peabody, Memphis, Tenn., September 12-14, and Secretary Roy Edmunds urges that members and others who plan to attend make early room reservations. With a strong program in the making, which will include many reports and addresses of interest to tie users as well as producers, it is expected that attendance will be unusually large this year. Highlights of the program will be presented in the September issue.

Track Supply Association; B. & B. Supply Men's Association

Lewis Thomas, secretary of the Track Supply Association, met with the Executive committee of the Roadmasters' Association on July 11 in Chicago, and G. Russell Betts, president of the B. & B. Supply Men's Association, met with the Executive committee of the Bridge and Building Association in Chicago on July 15. In both cases, these men outlined the plans of their respective associations for cooperation with the railway associations during their conventions in Chi-

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 12-14, 1949, Hotel Stevens, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

American Railway Engineering Association—Annual Meeting, March 14-16, 1950, Chicago. W. S. Lacher, secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—H. L. Dawson, secretary-treasurer, 1429 Eye street, N.W., Washington 5, D.C.

Bridge and Building Supply Men's Association—E. C. Gunther, secretary, 122 S. Michigan avenue, Chicago 3.

Maintenance of Way Club of Chicago—Next meeting, October 24, 1949. E. C. Patterson, secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Walter L. Turner, Jr., secretary, 30 Church street, New York.

National Railway Appliance Association—R. B. Fisher, secretary; Lewis Thomas, assistant secretary, 59 E. Van Buren street, Chicago 5.

Railway Tie Association—Annual convention, September 12-14, 1949, Peabody Hotel, Memphis, Tenn. Roy M. Edmonds, secretary-treasurer, 610 Shell Building, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting, September 12-14, 1949, Hotel Stevens, Chicago. Elise LaChance, secretary, 431 S. Dearborn street, Chicago 5.

Track Supply Association—Lewis Thomas, secretary, 59 E. Van Buren street, Chicago 5.

cago, September 12-14. A feature of the plans of the supply associations is the joint banquet which they will tender to all members of the Roadmasters' and Bridge and Building Associations on Tuesday, July 13.

American Railway Engineering Association

The most important activity on the agenda of the association for August will be a meeting of the Board of Direction, which will be held at the Chicago Engineers' Club on the ninth. The mailing of the 1949 Proceedings was started late in July, and it is expected that the Manual Supplement will be distributed some time in August. The only committee meeting scheduled for August is one to be held by the committee on Wood Bridges and Trestles at Cleveland, Ohio, late in the month.

Roadmasters' Association

The Executive committee met in Chicago on July 11, and, in company with chairmen of the various technical committees, reviewed all of the committee reports to be presented at the association's convention in Chicago, September 12-14. All of these reports are now in the hands of the Publications committee, and will be preprinted for distribution at the convention. The Executive committee also reviewed final details for the convention program, which, in addition to the committee reports, will include several prominent speakers; a trip to the foundry and frog and switch shop of the Pettibone Mulliken Corporation; a joint banquet with the Bridge and Building Association, tendered by the Track Supply and Bridge and Building Supply Men's Association; and an opportunity to attend the Railroad Fair on Chicago's waterfront. Those planning to attend the convention are urged to make early reservations with the Hotel Stevens, the convention headquarters.

B. & B. Association

In an all-day session, that extended well into the evening, the Executive committee, on July 15, at Chicago, reviewed and passed upon all of the eight technical committee reports to be presented before the association's convention in Chicago, September 12-14. Working with the Roadmasters' Association, which will meet the same dates in the same hotel, final plans were completed for the convention program, which will include several joint sessions with the Roadmasters; a number of special addresses; an inspection trip to the modern timber preservation plant of the Joslyn Manufacturing and Supply Company in Chicago; a joint banquet with the Roadmasters, tendered by the Bridge and Building Supply Men's Association and the Track Supply Association; and an opportunity to visit the Railroad Fair on Chicago's lake front. Those planning to attend the convention are urged to make early reservations with the Hotel Stevens—the convention headquarters.

(*Please turn to page* 790)

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Supply Trade News

General

The **Joy Manufacturing Company,** Oliver Building, Pittsburgh, Pa., has announced acquisition of all capital stock of the **Mines Equipment Company.** Joy will continue to manufacture the complete line of Mines' products, supplementing its own stationary and portable air compressors, pneumatic drills and hoists, and "Axivane" fans and blowers.

The **Warner & Swasey Co.,** Cleveland, Ohio, has announced the moving of two of their sales offices. The new England district office, in charge of **Humphrey R. Ward,** has been moved from the Kendall Square Building, Cambridge, Mass., to 20 Chestnut St., Needham 92, Mass., and the company's Buffalo office, in charge of **A. Sellers, Jr.,** has been moved from the Iroquois Building to the Vars Building, 344 Delaware avenue, Buffalo, N. Y.

The **American Brake Shoe Company** has contracted to purchase a former war plant at 344 Vulcan street, Tonawanda, N. Y., from the War Assets Administration. The plant will be operated by the company's **Ramapo Ajax division,** which plans to transfer certain operations from its Hillburn, N. Y., and Niagara Falls plants to the newly acquired plant.

The name of the **American Fork & Hoe Co.** has been changed to **True Temper Corporation.**

The **Link-Belt Company** has announced the removal of its Cleveland (Ohio) office to 314 Hanna building, Cleveland 15; of its Baltimore (Md.) office to 2315 St. Paul street, Baltimore 18; and of its Huntington (W. Va.) office to 1009 Fifth avenue, Huntington 1.

The **Ansul Chemical Company,** Marinette, Wis., has opened offices in Los Angeles, Cal., Fresno and Oakland, and will offer sales and service for the Ansul dry chemical fire extinguishers in the Pacific Coast states formerly served by the **Snowden Chemical Company,** Modesto, Cal.

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Personal

P. B. Mayfield has been appointed technical consultant on wood preservation for the Barrett division of the **Allied Chemical & Dye Corp.** Mr. Mayfield will be located at the company headquarters, 40 Rector street, New York 6.

S. F. Beatty, Jr., formerly assistant sales manager, has been named sales manager of the Gradall division of the **Warner & Swasey Co.,** Cleveland, Ohio. This company has announced the appointment of **John L. MacQuown** as representative at Hartford, Conn. Mr. MacQuown was formerly assigned to the Newark, N. J., and Cambridge, Mass., offices.

The **Browning Crane & Shovel Co.,** Cleveland, Ohio, has announced the appointment of **John R. Cary,** sales manager, succeeding **William H. Waite,** who has retired.

C. J. Beneke has been appointed product manager for the wire, rod, bar, structurals and cable division of the **Reynolds Metals Company,** at Louisville, Ky.

The **United States Steel Supply Company** (a subsidiary of the **United States Steel Corporation**) has taken over the organization and facilities of the concrete reinforcing bar division formerly operated by the **Carnegie-Illinois Steel Corporation** (also a U. S. Steel subsidiary), at Chicago, with the following changes in personnel: **George O. With,** who headed the bar division for Carnegie-Illinois, appointed assistant vice-president and general manager of sales in charge of the new and expanded service for U. S. Steel Supply; **Gregg A. DeLong,** formerly assistant to manager, specialty products division, Carnegie-Illinois' Pittsburgh (Pa.) sales department, appointed to the new post of assistant manager of sales; **Frank M. Waddell,** Cleveland, Ohio, **Everette C. Hunt,** Boston, Mass., and **Hal P. Kibbey,** Chicago, appointed assistant district managers at the cities named; and **Charles Wilson,** St. Paul, Minn., and **William Donovan,** Pittsburgh, appointed sales engineers at those two points.

(Please turn to page 792)

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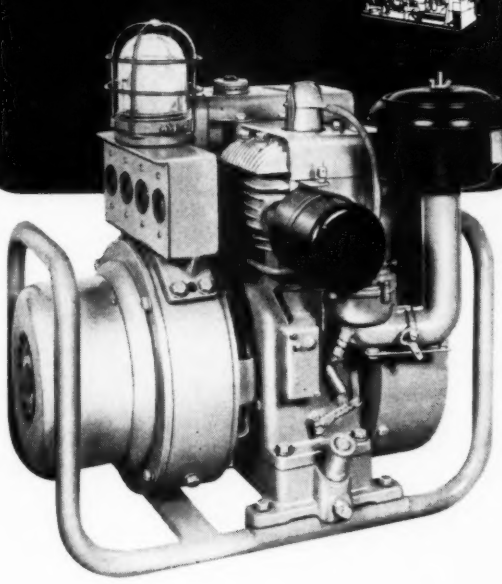

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Supply Trade News (Cont'd)

Hobart C. Ramsey, executive vice-president of **Worthington Pump & Machinery Corp.,** Harrison, N. J., has been elected president of that company. He will succeed **Clarence E. Searle,** who has been named vice-chairman of the board of directors. **Edwin J. Schwanhausser,** vice-president in charge of sales, will succeed Mr. Ramsey as executive vice-president, and **John J. Summersby,** assistant vice-president and general sales manager, has been appointed vice-president in charge of sales, succeeding Mr. Schwanhausser. Mr. Summersby has been succeeded by **Thomas J. Kehane,** formerly commercial vice-president on the Pacific Coast.

Lem Adams, vice-president in charge of the maintenance of way department of the **Oxweld Railroad Service Company,** a unit of **Union Carbide & Carbon Corp.,** with headquarters at Chicago, has assumed general supervision of the mechanical and construction departments in addition to his present duties, following the retirement of **Frank C. Hasse,** vice-president, mechanical and construction departments. **R. W. Torbert,** assistant to vice-president at Chicago, has been promoted to manager of the maintenance of way and construction departments, and **Clarence R. Strutz,** has been promoted to manager of the mechanical department.

Lem Adams

Mr. Adams graduated from Texas Agriculture and Mechanical College with a degree in civil engineering in 1908, and started his railroad career in June, 1909, in the engineering department of the Union Pacific. After holding various positions in the maintenance-of-way department, he was appointed roadway assistant, staff of president, system, with headquarters at Omaha, Neb., in 1920. In 1931 he became engineer, maintenance of way, being advanced to chief engineer in January, 1933. The following August he joined the Oxweld Railroad Service Company as chief engineer, and became vice-president of the company in February, 1939.

R. W. Torbert

Mr. Torbert, who is a graduate in civil engineering of the University of Delaware, entered railroad service in the engineering department of the Reading at Harrisburg, Pa. In 1926 he was appointed assistant supervisor, maintenance of way, and in 1934 was advanced to supervisor, maintenance of way. He subsequently held the latter position at Philadelphia, Pa., and West Trenton, N. J., until December, 1941, when he joined Oxweld as assistant chief engineer. In 1943 Mr. Torbert was promoted to assistant to vice-president in which capacity he was serving at the time of his recent appointment.

(*Please turn to page* 794)

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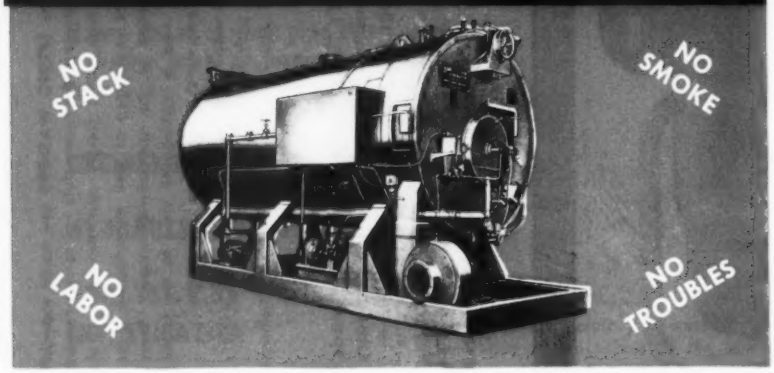
"The Railroad Boiler"

PRODUCT OF AMES IRON WORKS, OSWEGO, N. Y.



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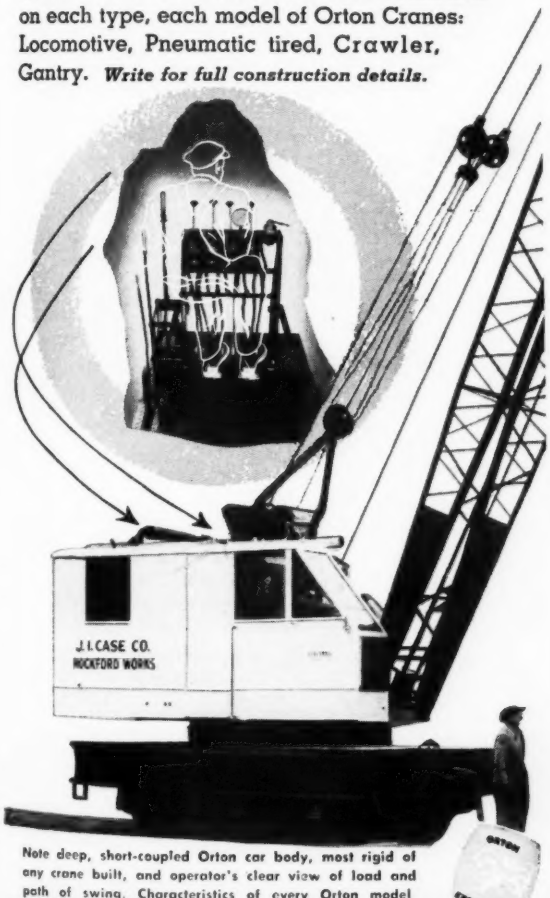

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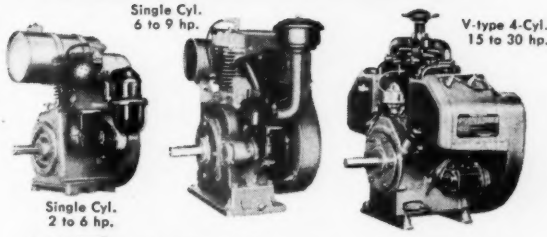
Here's Proof of Preference

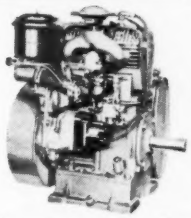
FOR **WISCONSIN** HEAVY-DUTY *Air-Cooled* **ENGINES**



40% of all Carburetor Type Engines Made during 1947 in 2 to 30 H.P. Range were WISCONSINS . . .

According to an official bulletin issued on April 22, 1949 by The Bureau of Census, U. S. Dept. of Commerce (Preliminary Industry Report, Series MC-31D, covering the production of Internal Combustion Engines in 1947), 4 out of every 10 carburetor type engines within our power range, were produced by Wisconsin Motor Corporation. Here are the actual figures:

Cubic Inch Displacement	Horse Power Range	Total Number Of Engines Built for Resale	Total Wisconsin Models Built for Resale	Percentage of Total Built by Wisconsin
11.0 to 20.9	**2 to 5**	173,964	90,106	**51.7%**
21.0 to 50.9	**5 to 9**	174,746	63,632	**36.4%**
76 to 100.9	**15 to 22**	56, 324	40,305	**71.6%**
101 to 175.9	**25 to 40**	123,029	18,131	**14.7%**
TOTALS		**528,063**	**212,174**	**40.2%**



Since these amazing figures were recorded, we have added two new air-cooled models, the TE- 2 cylinder having a displacement of 45.9 cu. inches and the TF- 2 cylinder with a displacement of 53.9 cu. inches. The horsepower range is from 8.5 to 13.3 for these models. The immediate popular acceptance of these engines and the growing demand for them has already placed them on a par with other top-ranking engines in the Wisconsin line.

The summary given above includes data received by the Census Bureau from 134 engine manufacturers. The groups given here does not include automotive, aircraft and outboard marine engines, built in 1947 for resale as separate power units or engines for use as original equipment by various equipment manufacturers for their own use.

Most Wanted! Most Made! Most Sold!

It is an interesting fact that these engines are extensively used in railway service not only as general utility power units on a great variety of power applications, but also as standard power units integrally mounted on many leading makes of railway maintenance equipment.

Wisconsin Engine leadership is an accomplished fact in *Service* as well as in *Census Statistics.*

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World's Largest Builders of Heavy-Duty Air-Cooled Engines
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Greater Comfort Greater Vision Greater Strength

Style L1

Nylon cups fitted with WILLSON-WELD* lenses for gas welding. Indirect ventilation reduces flash and glare hazard.

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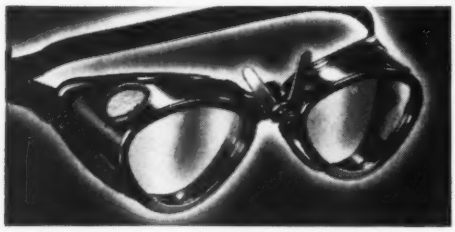
Nylon cups fitted with WILLSON Super-Tough* lenses for chipping, snagging and other heavy duty operations. Cups are well ventilated to reduce fogging.



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Whether the Burro is used to speed track laying or relocation, for bridge building, earth or ballast handling or on locomotive coaling jobs, it will handle every job more efficiently and economically—because Burro Cranes are built for railroad work.

Only BURRO *cranes have:*

- *Fast travel speeds—up to 22 M.P.H.*
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- *Elevated Boom Heels for working over high sided gondolas.*
- *Short tail swing—will not foul adjoining track.*
- *Low overall height—Burro can be loaded and worked on a standard flat car (see illustration).*

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CULLEN-FRIESTEDT CO., CHICAGO 23, ILL.

Supply Trade News (Cont'd)

H. D. Wright has been appointed director of sales, western region, for the **Industrial Brownhoist Corporation,** with headquarters in San Francisco, Cal.

Frank E. Cheshire, formerly vice-president of the Chicago, Indianapolis & Louisville and, more recently, transportation engineer with the General American Transportation Corporation, Chicago, has joined the **International Steel Company,** Evansville, Ind., as manager of sales for the firm's recently created railway division.

Arthur L. Berry, formerly special assistant to the president of the **Pullman-standard Car Manufacturing Company,** Chicago, has been appointed acting director of public relations. **E. Preston Calvert,** formerly associated with Carl Byoir & Associates, Inc., has been given the post of assistant director of public relations, and **Hugh W. Foster,** former associate editor of Pullman-Standard's "Carbuilder," has been appointed special assistant in charge of advertising.

William D. Hoffman has been appointed vice-president of the **Railway Track-Work Company. Robert M. Johnson,** until recently with the Dearborn Chemical Company, has been engaged as sales engineer. Mr. Johnson was associated for six years with the bridge, building, signal and water supply departments of the Chesapeake & Ohio.

The following personnel changes have been made in the pigment division of the **Reynolds Metals Company: A. P. Fleming,** formerly at the Philadelphia, Pa., office, transferred to New York as sales manager, a newly-created position; **F. W. Allsmiller,** assistant sales manager, transferred from New York to Louisville, Ky.; **J. W. Macauley,** of the New York office, assigned to the Pittsburgh, Pa., and Philadelphia territories, with headquarters in Philadelphia; **E. F. Reilly,** transferred from San Francisco, Cal., to Kansas City and assigned to the central states division; **A. H. Kleinfeldt,** made assistant to **Gordon M. Babcock,** technical director; **L. H. Besten,** placed in charge of sales service in the New York office, and **L. V. Shean,** transferred from the pigment division to the newly-formed chemical division.

Obituary

J. Frederic Byers, Sr., chairman of the board of the A. M. Byers Company, died recently in Roosevelt Hospital, New York.

Charles H. Morse, III, vice-president in charge of research, patents, traffic, the Western Pump division, manufacturing plants and production of Fairbanks, Morse & Co., with headquarters at Chicago, was killed on July 9 when a company plane in which he was making a business flight to St. Louis, Mo., crashed and burned near Roanoke, Ill.

With Supplement Bringing Information Up to July, 1948

ROADWAY AND TRACK

By WALTER F. RENCH

Formerly Supervisor on the Pennsylvania

Use of the latest mechanical equipment in roadway and track maintenance is clearly described and pictured. Older methods employed where full mechanical equipment is not available are also explained. Most of the methods described are those in use on the *Pennsylvania* but A.R.E.A. recommended practices and those in use on other well maintained roads are included. The economics resulting from the adoption of modern methods are clearly outlined.

While written primarily for track supervisors and other maintenance officers, the new edition contains material of interest to transportation and mechanical officers who require a working knowledge of fundamentals of track work. Section and extra gang foremen who wish to acquire a working knowledge of their work will find it in this book.

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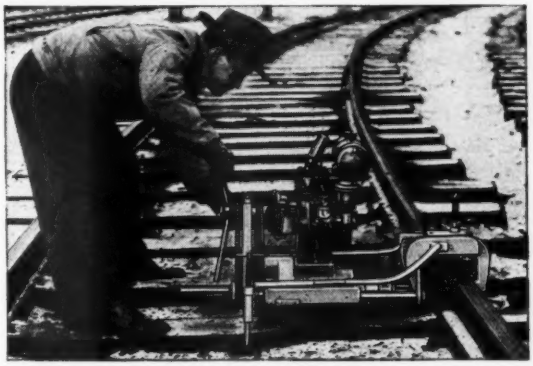
WITH SPEEDY, EASY-OPERATING RTW DRILLS AND GRINDERS

Six days' work in five! You'll have to put track in condition fast to meet new work schedules—and you can! Low-cost, low-manpower RTW Drills and Grinders speed up your maintenance work . . . enable you to keep rails ship-shape without crowding your track gangs . . . and save you money to boot!

Two popular RTW maintenance machines are shown below—others available also give you labor-saving advantages at substantial savings.



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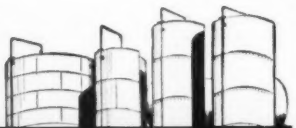

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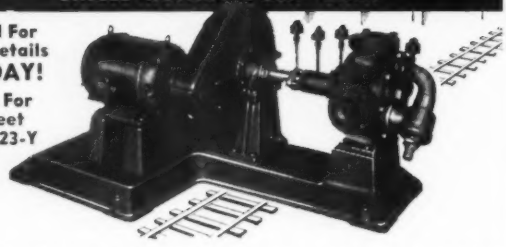

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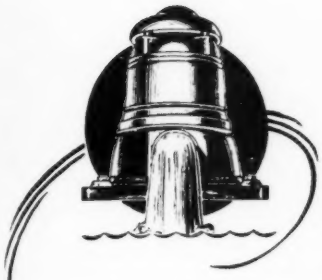

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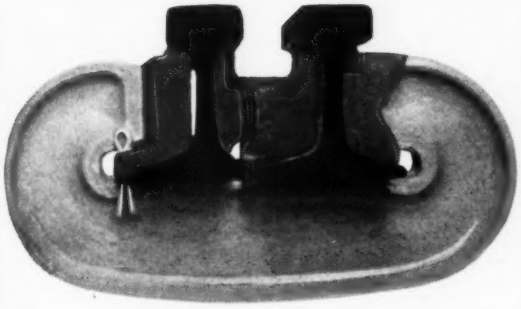

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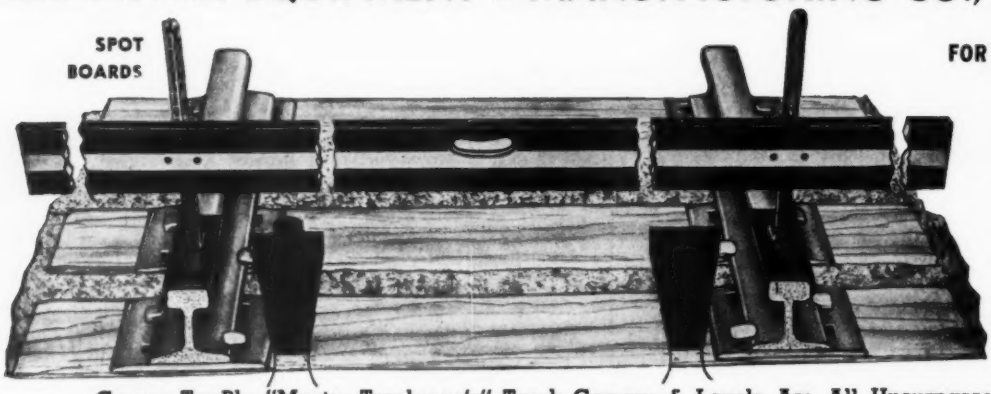

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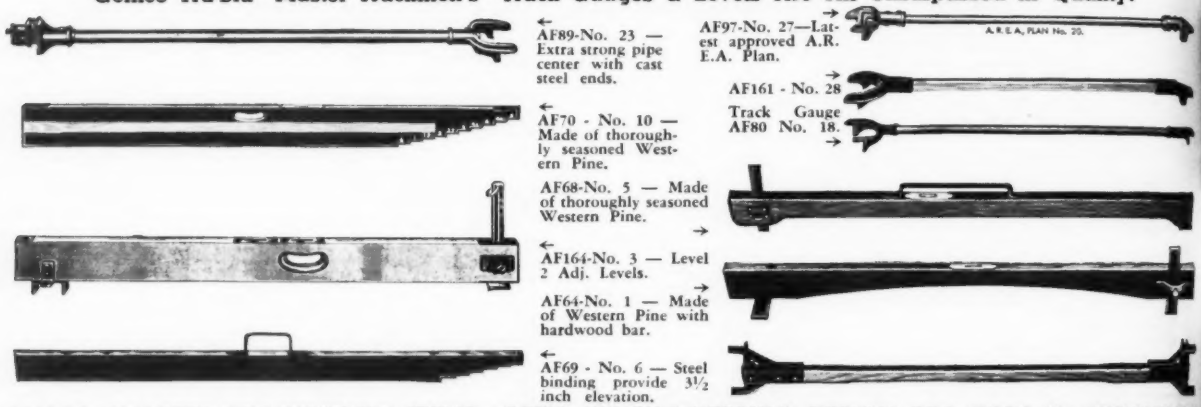

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SPIKE HAMMER. . . . All spikes driven straight and at big savings in time and labor.

SPIKE PULLER. . . . By getting spikes out faster this machine speeds up relaying and reduces the cost of the entire operation.

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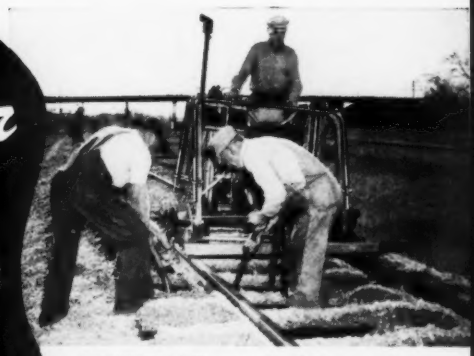
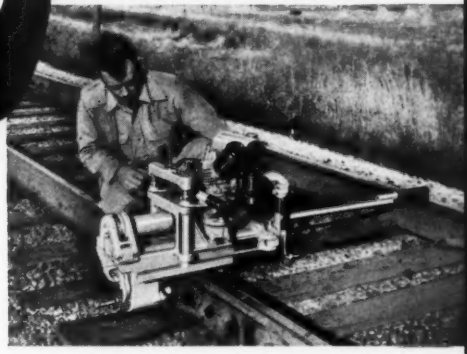


POWER JACK. . . . For better surface and alignment where track is raised on ballasting and surfacing jobs.

RAIL GRINDER. . . . With four types of grinders, Nordberg can supply the machine best adapted to any type of maintenance grinding.



RAIL DRILL. . . . A compact, lightweight, low-cost, easily set drill that proves a money saver wherever rail must be drilled.

UTILITY GRINDER. . . . Particularly suited for work in congested traffic areas. With other Nordberg accessories, it can be used for surface grinding, rail end slotting, frog grinding, etc.

FOR over twenty years, Nordberg has been the nation's foremost builder of dependable machinery, developed in cooperation with track maintenance men to meet their specific requirements. These years of experience in developing Nordberg equipment has resulted in revolutionized maintenance methods in scores of operations formerly done by hand . . . and in doing them better, faster and at lower cost. It will pay you to investigate the merits of the latest Nordberg time and money saving track maintenance machinery. Call or write for literature describing any or all of these Nordberg products.

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CRIBEX. . . . Thoroughly cleans cribs at a high production rate.

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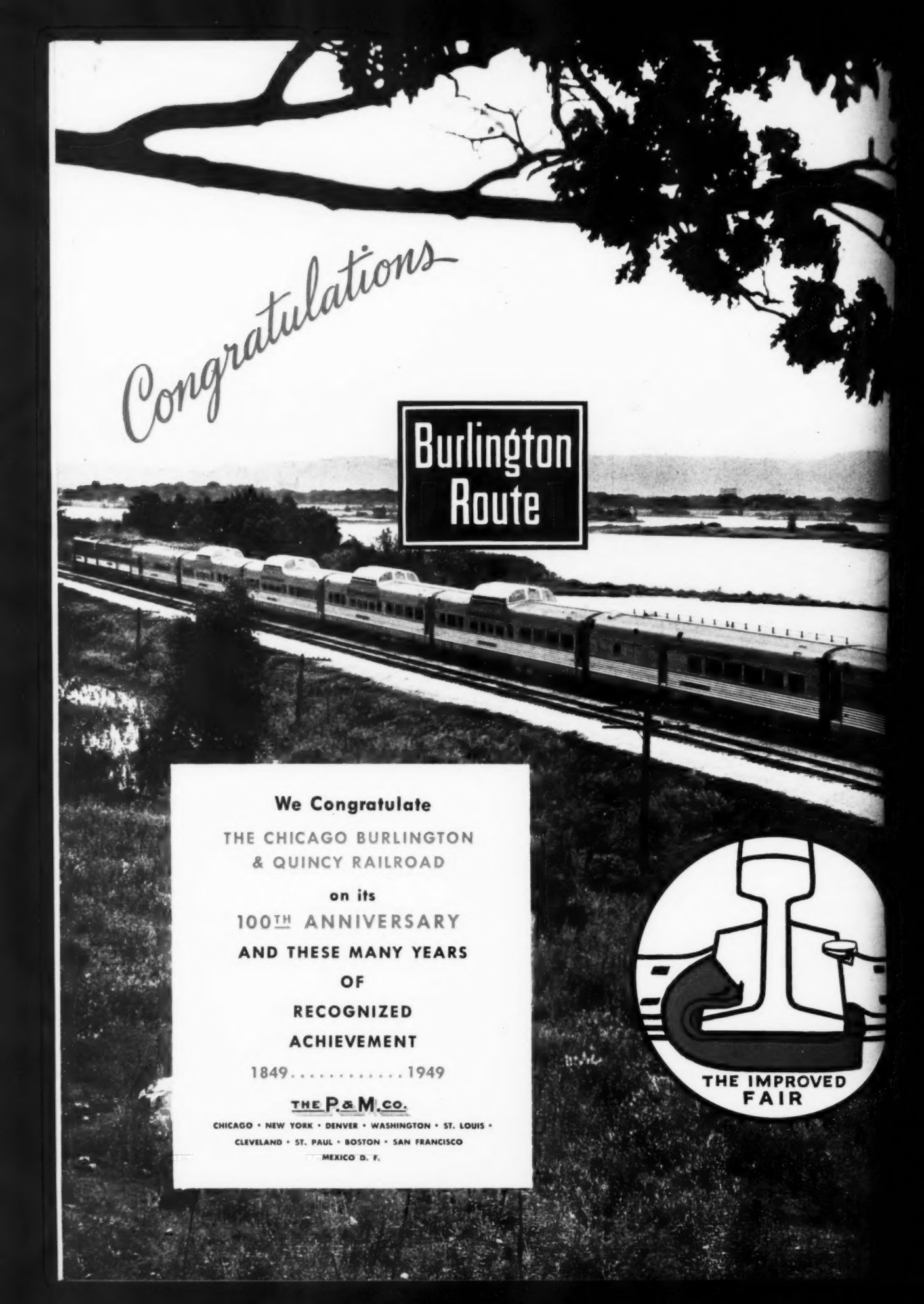
Saves time — Does better work — Reduces expense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